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ESTABLISHED 1855

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The Next Move

UNDER the radical bureaucracy established through the emergency powers conferred upon the President by the last Congress, industry and business have been belabored and bedamned. No appeal to reason or fair play could be expected to move minds closed to the virtues of the profit motive and already consecrated to socialistic regimentation.

True, many of the members of the last Congress abdicated their powers in the patriotic endeavor to help the Administration meet an emergency. As Upton Sinclair said of the voters in the last election, "perhaps they would not have voted as they did had they known what was going to be done."

The forces of sound conservatism and common sense, shocked into temporary paralysis by the astounding actions of the radical clique which has ruled America for the past 14 months, are now rallying spontaneously in all parts of our country. They are no longer inarticulate.

Because of this, the next Congress will have more to say about things than the last one did. It is not likely that two sessions, hand running, can be made to sing the "amen chorus."

Business, therefore, can expect a better and fairer deal from our legislators, provided business lives up

to its present opportunities. It should "take the play" away from the professors by sponsoring a practical plan to put the unemployed to work.

Business could not have produced such a plan a year ago, for it was unorganized and had no means of collective expression. That is not true today. A call issued by a volunteer committee could now summon, in a week's time, the appointed representatives of a vast majority of businesses and industries.

Such a meeting should be called. And it should result in a report to the next Congress which would convincingly show what must be done and undone to effect reemployment.

If business and industry sponsor a practical plan for recovery, they will find agriculture ready to put its great political influence back of it. For agriculture, too, is "fed up" on impractical experimentation.

If we speak with a collective voice, we will be listened to by the next Congress. If we do not, the professors will continue to speak and to act for us.

John M. Hawk

Recovery, Wages

HERE is a machinery builder's rejoinder to "Wages Must Follow the Price of Gold," which appeared in *The Iron Age* of Aug. 2 and 9. Mr. Bath does not agree with Mr. Losely that increasing wages is the way to recovery. And his reasons for disagreeing are both interesting and effective.

The metal-working industry needs to know more about gold, even though this metal is one not encountered in the great majority of metal-working plants. For the invisible effects of gold are likely to have important influences on all of us.

THE change in the price of gold was made to restore the prime commodity prices. The prices of farmers' goods, lumber, et cetera, because of the increasing value of gold had dropped 60 per cent in price, prior to revaluation. Wages had not fallen nearly so far. Restoring prime prices, even if only partially, put men back to work. To raise wages now would tend to recreate the disparity in prices which had previously stopped trade. Men want weekly wages with full hours, not meaningless hourly wage increases which make the product too costly to sell with resulting unemployment. Three years ago England repriced gold by substantially the same amount as did the United States later. Of England the *New York Times* of Aug. 6 has this to say, "Recovery is not coming—it has come. England's trade is practically normal." Yet the average wage showed no increase—more hours were worked.* A little reflection will make this clear.

Gold as a redemption medium for currency has been in use by most of the larger trading nations of the world for about one hundred and fifty years. It was assumed that because, for instance, the dollar was always redeemable for 22 grains of gold that its value would be always the same. Nothing could be farther from the truth. The value of gold itself fluctuates more violently than almost any other commodity. By the value of gold I do not mean the artificial price arbitrarily set on it some

one hundred years ago by our Congress but its purchasing power over the average of other things. Gold is an international commodity just like anything else. So is silver and copper and iron and lead. So are wheat and copra, coal, scrap iron, lumber, hides, silk and rubber. They exchange in about the same relation to one another the world over. There are 30 or 40 prime commodities from which are derived all the various manufactured articles entering trade. If on the average a given quantity of these will exchange for an ounce of gold at some given date and later we find that half an ounce will buy the same amount, the logical inference is that gold has become more valuable—not that all the other goods are worth less; not that the regiment is out of step with one man, but that the one man is out of step with the regiment.

Gold Fluctuations

From the records of the Statistical Society of Great Britain the attached chart indicates the fluctuations in the purchasing power of gold over the average of other things for one hundred and fifty years. The changes have been tremendous. Prof. Irving Fisher puts it: "If the American dollar was really (\$1.00) in January 1865, then in 1896 it was \$3.19; if it was a dollar in 1896, then in 1913 it was 67 cents; if it was a dollar in 1913, then in May 1920 it was 45 cents; if it was a dollar in May 1920, then in March 1933 it was \$2.82."

When Congress fixed the price of gold at 22 odd dollars an ounce it

did not give us a stable money, it only made sure that no matter how violently the value of gold might change our money would change with it too and the record of our panics and depressions, our booms and inflations has been the sorrowful story of that changing of values ever since.

Long ago we learned in less important things to create standards. For many years those standards have been becoming more exact till in our own trades we are accustomed to work in split thousandths but as a standard of value we have adopted a single commodity, the value of which is never the same from one year's end to the next and which will change as much as one hundred per cent in two or three years. If I were to give my shop the blue prints for a new machine carefully worked out in thousandth tolerances and left them nothing but a wooden yard rule to work with, a rule which might only change a thirty-second of an inch in three feet, you who read *THE IRON AGE* know what kind of a product I would get. And you know too if I went and kicked about it to the shop superintendent what sort of blasphemous reply would be mine, yet we have left the management of our affairs to men who must work with standards which fluctuate so madly, so incomprehensibly that the very best brains have been utterly at a loss. Is it not a thing of wonder that we exchange our services, our engineering brains, our mechanical ability, our steel, our machinery for money without knowing something at least about this money we are getting as our share of the bargain? Is it not strange that we specialize and strive all our lives to get money, neither knowing what it is nor what it will be worth when we get it?

Partly, I think this is because we have thought the matter too complicated. It is to laugh. Money, for the engineers I have known, if they would but put their minds to it, is a much more simple matter than problems they meet every day. It is that we have been confused and bemused

*London Cambridge Economic Service for July.

and Gold

By **CYRIL J. BATH**

President, Steelweld Machinery Co.

by people who thought they understood it and more largely still because we never thought about it at all. We've got to think now.

The Prime Third of Population

The excuse generally given by gold standard apologists for the horrible changes in our money values is that they are the same for everybody. A little thought will show this is not true. Most of us are too prone to think only in terms of wages and manufactured things. Roughly our population can be divided into three groups. About one-third of our people are engaged in the production of what I will call world competitive commodities such as silver and copper, lead, cotton, wheat, hides, oats, lumber, petroleum, et cetera. Another third are engaged in turning these prime goods into manufactured goods. The third group might be referred to as the service group taking in the railroads and utilities, medicine, law and government generally. If anything tends to seriously disturb the price relations between the producers of prime goods and the manufacturers the service groups will have little to do. Industry will be stymied because the two prime groups cannot exchange their products. That is precisely what did occur starting in 1928.

World priced commodities exchange the world over, freight and tariff allowed for, for the same amount of gold. As the value of gold went up the price of world commodities went down. For instance, in 1926 a bale of cotton exchanged for five ounces of gold. In our own country an ounce of gold was 22 dollars and consequently a bale of cotton was worth around 110 dollars. As gold increased in value, very soon

1½ ounces of gold would buy a bale of cotton and an ounce of gold was still priced at 22 dollars; consequently, a bale of cotton was worth 33 dollars. And wheat that was a dollar and a half soon was fifty cents. You can see what happened. When the wheat farmer was in 1926 getting \$1.50 for his wheat he had to pay perhaps 25c. for railroad and warehouse charges, 25c. perhaps on taxes and debts. He had one dollar left to buy needed tools and manufactured articles. By the time wheat hit 50c. he had nothing left to spend on manufactured goods at all. In many cases he couldn't even pay freight to market and certainly not pay debts and taxes and live. Multiply the wheat farmer's situation by the entire groups of prime producers, one-third of the population of the United States, and you can see why trade started to dry up. Very soon the manufacturers felt the loss of the business and started laying off men. This added the poverty of the laborers to the poverty of the prime producers and still further curtailed the demand for prime goods.

The Shuttlecock of Disaster

Back and forth the vicious shuttlecock of disaster shot—solemnly observed by bullet-headed stupidity as a "normal" process. This kept up until gold was worth so much more than anything else that everyone tried to get it at once. The banks blew, the gold standard was suspended in April of 1933 and the dollar was worth just what the trading world thought it was worth. By the time this occurred manufactured goods had on the average dropped some 25 per cent from the 1926 level, wages 20 per cent, commodities about 60 per cent and debts, taxes, railroad



CYRIL J. BATH

rates not at all. Is it any wonder that a monetary system capable of causing such a debacle broke down? The marvel is that anyone should want to get going again. If you wanted gold now you had to buy francs or other gold standard currencies or bid in the world markets for it. By watching this from day to day it was easy for anyone to see what the dollar was worth. Gradually it cut loose from its golden anchorage and the price of gold advanced. As gold went up in price so of course did gold equivalents. So did silver; so did copper; so did wheat and cotton. In nine months the income of the farmers and prime producers of this country was up 50 per cent. Because this income had gone so low even a 50 per cent rise was far short of the wage level. They didn't keep this money or throw it away. They bought desperately needed manufactured goods and the factories in a few months had the greatest rise in industrial activity in history. From April to July as the dollar approached its old purchasing power up went business.

Uncle Sam Horns In

Then something happened. It would never do for any government to be in the midst of a recovery and not be in on it somewhere. So we got the A.A.A. and the N.R.A. and the

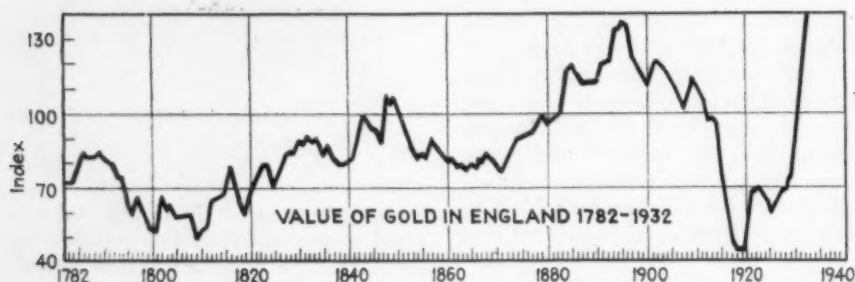
A.W.O.L. and basketfuls of CCC's. Government which after twelve years of trying to manage just one business, alcohol, and which had just given up in despair, started in cheerfully to manage everybody's business and all the commodities and securities too. The terrible wrong which natural process had tended to correct by restoring the buying power of the prime producer groups was largely offset by artificially attempting to codify and raise the cost of manufactured goods, and so to recreate the disparity which had existed. Trade of course started to slow down. What I am saying now I was saying in July of 1933 as often and as publicly possible.

Mr. Losely has a very different theory of the value of gold. It is not, he says, its purchasing power that makes its value. It is what it costs to produce. This is a very novel theory of value for anything. What

mine went up just about 70 per cent. It went so high as to shut down many mines and greatly reduce world output.

Value of Gold Is Its Purchasing Power

The value of gold is its purchasing power. It has little to do with production costs. Costs in the instance given were going up but the value of gold was going down. Toward the end of his article Mr. Losely says we can look forward to a price level of 140 per cent of 1926. He says this because he falls into the common error of thinking gold has a constant purchasing power over goods; because he thinks that the rise due to the adjustment of the gold price has not yet taken place. It took place at once as far as the prime markets were concerned. The only thing that



happens when, as was the case recently, the United States and France between them get two-thirds of the gold supply of the world locked up in their vaults? What would happen if two-thirds of the cotton crop were cornered? Wouldn't the value of the remaining free cotton shoot up? Would Mr. Losely repeal the law of supply and demand in relation to gold? Gold is just another commodity more subject to manipulation than the rest. Its value is set by the supply and demand for gold, just like anything else. In fact when from 1914 on the other gold standard nations of the world were shipping gold to us in exchange for goods in three years we imported a 70 per cent addition to our monetary gold stock. Gold became more plentiful and therefore less valuable. In those three years it dropped in value 74 per cent.* That is to say our prime price levels of commodities went up that much. No it wasn't due to world demand for everything else because the same goods in silver standard countries or in silver in our own countries had no such rise. During this period the cost of producing gold in any given

could make a price level of 140 per cent of 1926 would be for gold to get approximately half as valuable as it is now or for the present price to be doubled.

Here is the situation today. Prime commodities dropped 60 per cent and came back half way. Wages from the 1926 level on the whole had about a 20 per cent drop; they have come back on the whole most of the way. You have this picture then: commodity producers are getting 60 per cent of 1926 values, wages are at 90 per cent of 1926 values and Mr. Losely thinks they should be raised further. It can't be done. Not that we wouldn't all like a 40 per cent rise but the rise we would get would likely be into the street. *People have got to get over thinking of wages as coming out of industry—they are paid by the whole community and, if you try to pay a wage scale which is exorbitant from the standpoint of the values received by farmers and other large sections of the population you won't do any business.*

From March of 1933 to January of 1934 wheat for instance went from 47c. to around a dollar; cotton from six cents a pound to around 10c.;

silver from 27c. an ounce to around 45c.; copper from five cents to around nine cents; lumber went up 35 per cent to 40 per cent; so did all free commodities. When Mr. Roosevelt announced a fifty-nine cent dollar in January he only confirmed the value of money which had been gradually obtained over a period of nine months.

No Overnight Changes

There was no sudden overnight change such as Mr. Losely imagines. Now how about steel and the machinery businesses? Well frankly, we kept our prices up pretty well thank you, but we did no business. Thirty dollars a ton was steel before the collapse and it never went much lower. As a matter of fact, at its present level the steel people wouldn't be making more than the usually long face—if they had some business. What steel and machinery want isn't a price rise but production. Give your commodity producers price and your manufacturers automatically get production.

Mr. Losely charges that Prof. Warren has overlooked the possibility of a constant value for gold being found in an ideally located mine producing a sufficient amount of gold for all occasions at a constant price. No Prof. Warren didn't overlook it. He just knows there "aint no sich animal" and there has never been in the history of man. Why consider a fantasy—this is a serious business. What we must get clearly in mind is that when the value of money changes it doesn't change at once or for everyone alike. The commodity producers in the world markets get it first, up or down. Other things follow. Some things try not to change at all. Most serious of all, debts don't change; mortgages and taxes stay just as high. Freight rates, telephone rates, gas and light bills, all the service trades tend to stay put. Wheat has to sell in competition but the freight from Wichita to Chicago stays just as high as ever. Manufactured goods don't go down alike or together. Everything is thrown out of gear. When the previous value of money is restored those things, generally speaking, that went down first go up first and in proportion as they dropped.

In Detroit due to various governmental and union activities wages are in dollars per hour above 1926 prices, yet dollars are buying 40 per cent more on the average of prime goods than they did in 1926. Surely the last thing to do is to raise wages further. On the contrary, *the rise in gold values has not gone nearly far*

* See Warren and Pearson "Prices."

enough to bring the prime goods anywhere near into line with present wage scales. Only as this is done can the nation prosper or work become plentiful. We have all been through a hard time. By mistaken governmental action we are going to have some more of it. Instead of being glad to get a job and a chance to work we want Utopia; instead of

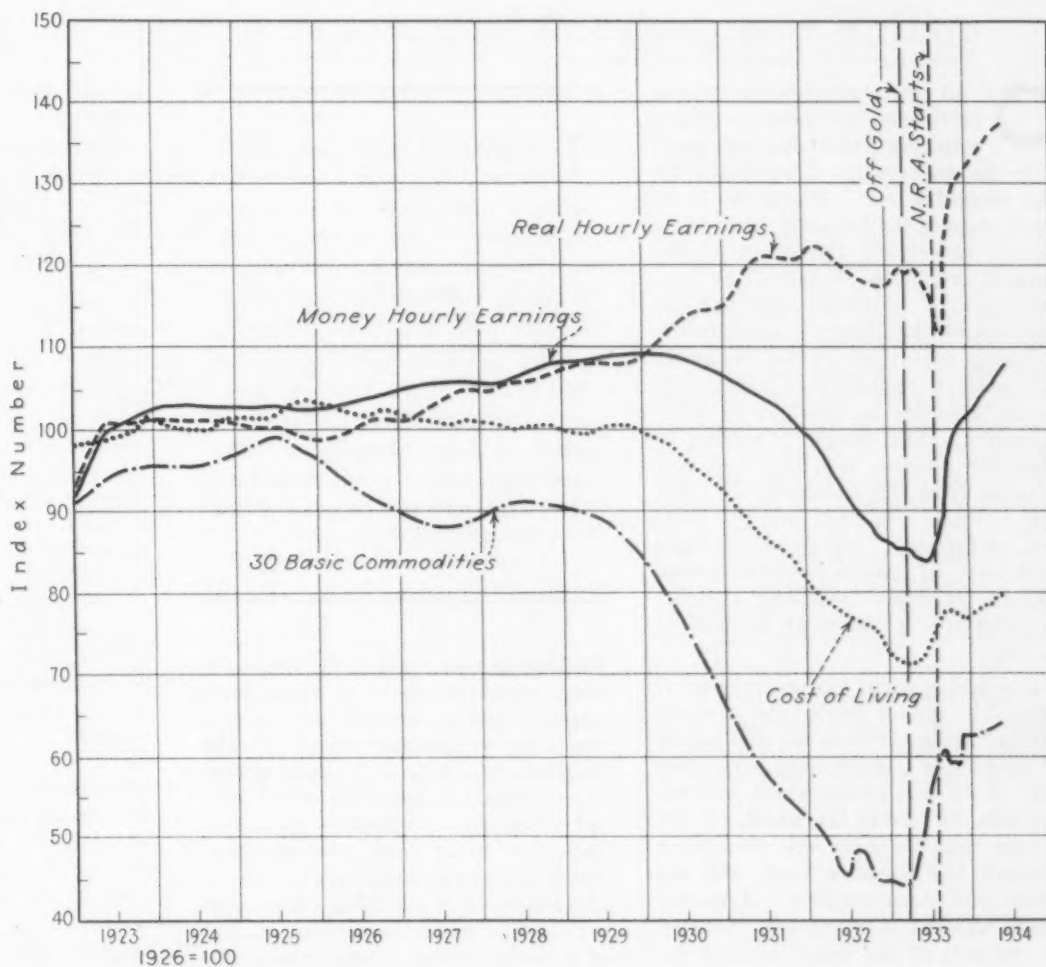
are throwing aside the accumulated experiences of our forefathers and remodeling a state which had done more for its citizens than any other we know of, England and the pound group of nations with a pure managed currency, which fluctuates very little, are recapturing world trade. Here is what the largest bank in the world has to say. This is from the

business for the rest of us and prevented a social revolution probably but it didn't go far enough. The value of money had doubled, we only canceled part of it. The nation staggered and fell under the impossible load. Part of that load was taken off our backs but the dollar, compared with 1926 levels, is still \$1.47. It's high enough that with the added bur-

Money Wages and Cost of Living Index from the National Industrial Conference Board's Records.

Thirty Basic World Priced Commodities from Warren and Pearson's Index.

AS hourly wages have risen, the discrepancy between the purchasing power of prime commodity producers and the wage earning classes has been recreated. The whole theory of the N.R.A., of decreasing hours of work and increasing hourly wages, works in precisely the wrong direction. The choice ahead lies in further cheapening money or of standing pat until the regulatory measures break down of their own weight. A third possibility is that gold may become less valuable by natural causes. Wages HAVE followed the price of gold but it has been an economic error of the first magnitude.



trying to get back on our feet we have decided to try to fly!

Looking for Utopia

Like the dog in the fable, we have dropped in the water the bone we had in our mouths—a substantial rise in prime goods—and look in vain for the mirage of a new society. The downfall of democracy has been bureaucracy—like a cancer in our midst has been its recent growth. While we have been indulging in paternalistic codification of business and supporting an army of crack-down General Johnsons, other nations have got down to brass tacks and are prospering. While we are being governmentally led into no one knows what labyrinth of regulations; while we

Midland Bank in London. Its November report says: "Sterling is a pure managed currency, almost completely divorced from gold for an indefinite period. It provides the only basis for true monetary stability in the world today. * * * Recovery set in shortly after our departure from gold and has continued ever since. This recovery has been steady and has been shared in, one after another, by those countries that had taken the same step."

This much is clear. There won't be any 40 per cent wage raise for anyone unless the prime producers get more money for their goods. The raise in the price of gold from 22 to 35 dollars an ounce brought their prices back part way and made some

den of governmental regulation we cannot maintain headway. Debts are still fearfully high; mortgages are still unpayable largely. On top of years of bitter hardship a cheap dollar would be far preferable to one that is still too dear. We are going to learn that if our government had fulfilled its function of understanding and managing money it would not now have to be trying to manage all our other activities. We are going to learn it apparently by watching the other nations do it first and by force of trade competition we shall follow. In the meantime we shall have difficulty holding the wage levels we have unless we bring our money further in line with the value which prevailed from 1922 to 1928.

How Attractive Finish Helps

OF all manufacturing operations performed on metal products, polishing and buffing are probably the most costly. Two causes for this condition are: First, the backward state of the art itself, little being known concerning the effect of the several variables involved in the processes of polishing and buffing; and second, the failure to consider the finishing operations in the design of the product. Established practice in design accounts for most every other operation. The design is studied to ascertain whether it is the most economical from the standpoint of turning, drilling, planing, milling, welding, or forming. But in not a single part, out of hundreds investigated, was the process of polishing a factor in determining the most economical design.

A polishing wheel has several limitations. It cannot work into a sharp corner. It cannot work for any length of time along a sharp edge perpendicular to the axis of the wheel, projecting into the face of the wheel, for the reason that the edge will soon wear through the abrasive head, and the wheel will cease cutting. It cannot polish against a sharp edge parallel to the axis of the wheel without destroying the edge and in a short time stripping the abrasive head from the wheel. It cannot, unless it is a very soft wheel, adapt itself to changes in the contour of a surface, and even with such a wheel the variation in contour that will be covered is limited.

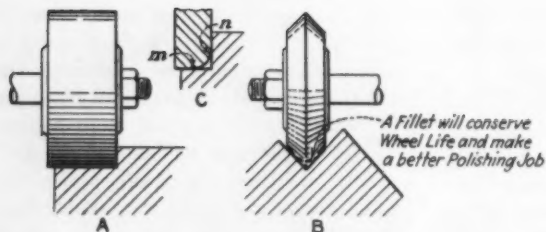


FIG. 1

THE group of paint and enamel articles being published in this series is interrupted at this point to present by request this article, which describes many methods for reducing finishing costs by changing the basic design of the metal product. Other examples of how design may affect finishing costs will be included later in this series which is being prepared for The Iron Age. Mr. Kent, the author, is consulting engineer at 32 West Fortieth Street, New York.

Furthermore, with a soft wheel, the work cannot be held to close tolerances. Hence, changes in contour must be scrutinized closely if the finished surface is to be held within close limits. A polishing wheel cannot climb over projections on a surface, but must work around them. These are the principal limitations to the action of a polishing wheel and, with a few minor exceptions, to that of a buffing wheel. Other limitations will appear in the discussion that follows.

Terms Defined

First, to clarify the subject, the following definitions are repeated, and the words polishing and buffing will

be used hereafter according to these definitions. Polishing is the art of producing a smooth, uniform surface on metal by means of an abrasive wheel, of greater or less flexibility, the abrasive being glued to the face of the wheel. Buffing is the art of putting a luster or "color" on a polished surface, by means of an abrasive composition, bonded with a wax or grease, which is smeared on the face of a buffing wheel.

Let us consider briefly the limitations of some polishing applications as related to design. Fig. 1 shows two ways in which a wheel may work in a sharp corner. Apparently the surfaces with which a wheel is in contact will be polished right up to the vertex of the angle. Practically, however, since a polishing wheel is more or less flexible, and the abrasive head on it is comparatively thin, the sharp edge of the wheel will very soon become rounded, as in C, and the surface of the work from m to n will remain unpolished. The wheel shown at A will retain its form longer than the wheel shown at B, but two operations will be necessary to finish the two sides of the angle. If the function of the piece is such that there is no necessity for a sharp corner, the provision of a generous fillet in the corner, as shown by the dotted line in B, will assure a long life of wheel head and permit polishing in a single operation.

Fig. 2 shows the converse of Fig. 1, that is, a sharp edge on the work

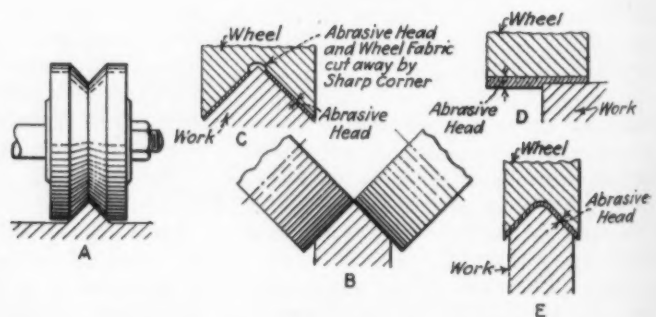


FIG. 2

Design as a Factor in Economical Polishing and Buffing

instead of on the wheel. If the surfaces on both sides of the edge are to be polished, obviously the most economical method is a single operation with a wheel grooved to conform to the surface, as at *A*. In practice, however, the sharp edge of the angle would soon cut through the abrasive head and into the fabric, as at *C*, thus not only failing to polish the vertex of the angle, but also spoiling the wheel.

The alternative method involving two operations is shown at *B*. If this latter method is used, another complication may develop. If the wheel is wider than the work, a groove the width of the polished surface will be worn in the wheel, as shown at *D*. This may be overcome either by oscillating the new wheel axially, or by moving

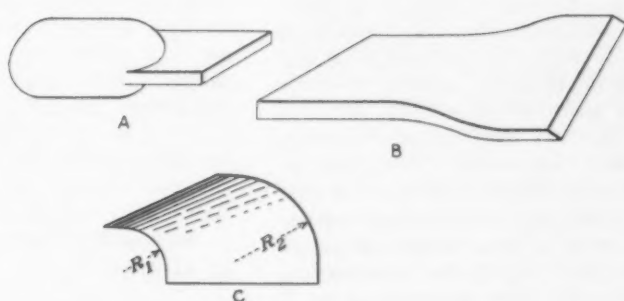
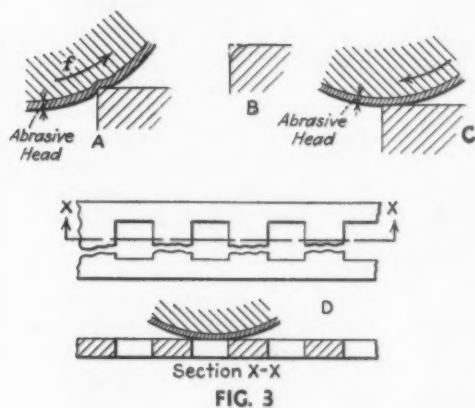
The form of the work that will permit the most economical polishing, obviously, is that shown at *E*, where the sharp corner is rounded off and a grooved wheel conforming to the contour is used.

Difficulty With Sharp Edges

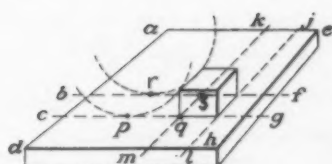
The effect on both wheel and work, of a wheel working against a sharp edge, is shown in Fig. 3. At *A* a sharp corner is represented, with the wheel in contact with it. The thickness of the abrasive head and of the flexing of the wheel are exaggerated in order to show the action that takes place. The cushion of the wheel is slightly compressed, as shown at *F*, the abrasive head following the tushion into the resulting depression. The sharp corner of the work digs into the head

and has much the same effect on the surface of the wheel as a lathe tool has on a piece in a lathe. The abrasive grain is torn bodily from the glue in which it is embedded and the wheel is soon stripped bare. The effect on the work is shown at *B*. Instead of the sharp corner intended by the designer, a more or less irregular rounded edge is formed, due to the wear of the wheel and to irregularity of pressure of the wheel on the work. The proper relation of wheel and work is shown at *C*. The edge is this case will be left sharp and the life of the wheel head will be greatly prolonged.

At *D* in Fig. 3 is shown a construction where advantage may be taken of this tendency to round the corners by a wheel working against an edge.



the work across the face of the wheel. The latter is usually possible in polishing by hand at the lathe, but not always possible when the work is done in a polishing machine. The designer, therefore, must take into consideration whether the polishing is to be done by hand or by automatic machine.



The piece in question is a slotted plate. In cutting the slots slight burrs are left on the edges, which it is necessary to remove. It is also desirable to round the edges to a very small radius. The polishing wheel will be supported on the solid section of the plate at the sides, and will project into the slots

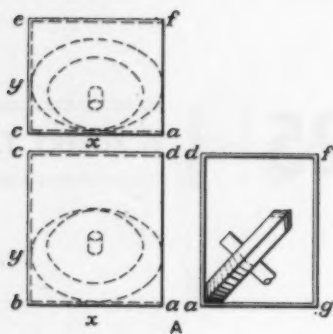


FIG. 6

only a very slight distance. The rounding effect will be minute, and the stripping of the wheel head almost negligible. By selecting a wheel of proper density and exercising care in the application of its pressure on the work, almost any desired degree of rounding can be obtained. Reversing the direction of travel of the work will round the opposite edge. If a very hard wheel is used, it will not project into the slots at all, and practically no rounding will occur.

Avoid Contour Change

The meaning of change of contour is illustrated in Fig. 4. Change of contour may be the junction of two entirely dissimilar surfaces, as at A, where a plane surface intersects a cylindrical one, or a change in direction of the plane of a surface, as at B. Another case of change of contour is shown at C, where two planes at an angle to each other are joined by an arc of continually increasing radius. These are but three elementary cases out of an infinite number of possible cases of change of contour. Change of contour presents one of the most difficult and expensive of all problems for the polishing and buffing departments, and the designer should make every possible effort to avoid it. The most casual inspection will make obvious the fact that no one formed wheel can be devised that will finish the plane and cylindrical surfaces of A at a single operation, or one that will fit the ever-varying radius of C. The piece shown at B can be finished with a flat wheel of the same width as the work, by twisting the work as it passes the wheel. Even so, the warped surface at the twist will require some touching up, at an increase of time and expense. Even if such a part were produced in sufficiently large quantities as to warrant finishing in a straight-line automatic machine, the type of fixture necessary to hold the work, and so present it to the wheel as to permit covering the entire surface, would be

extremely complicated, and the cost would probably be prohibitive.

A single case is shown in Fig. 5 to illustrate how a projection will vastly increase the cost of polishing. The polishing wheel will traverse the surface until it comes in contact with the projection. The strip *p-q-r-s* will remain unpolished. To completely polish the surface, four passes are required to cover strips *a-b-f-e*, *a-k-m-d*, *c-d-h-g*, *h-e-j-l*. Unless prevented by constructional reasons, the projection could be made a separate piece, doweled or screwed to the primary surface. In such an event the entire surface *a-e-h-d* could be finished in a single pass at a much lower polishing cost.

Projections are particularly objectionable in parts where quantity production is involved. In such cases an automatic polishing or buffing machine is indicated, but a projecting part almost invariably precludes the use of such equipment. A lug or a ridge in the path of the wheel will relegate the work to the hand lathe with a consequent tremendous increase in cost. What this increased cost may mean is illustrated by a classic example. Five men with automatic equipment finished the same quantity of work as 30 hand-polishers. Where quantity production is involved, the designer should study the form of the parts most carefully, to adapt them to automatic polishing and buffing if at all possible.

Some Practical Cases

Having considered the elementary limitations of polishing and buffing

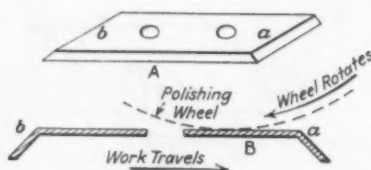


FIG. 8

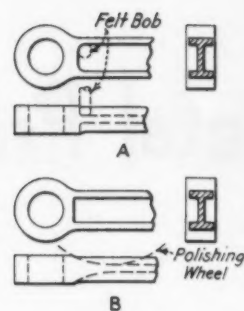


FIG. 7

wheels as related to design, let us examine a few actual cases. Fig. 6 shows two designs of an oven that required polishing over the entire inner surface. The original design is at A. In the front elevation is shown the formed face wheel with which it was proposed to polish into the corners. This was impracticable, not only because the wheel would wear out quickly on the vertex of the angle, as previously discussed, but also because it is impossible to reach the bottoms of the corners, leaving unpolished the surfaces comprehended between *x* and *y* in the plan and the side elevation. The revised design is shown at B. The edges are rounded to the radius of the smallest wheel that can be used. Consequently, the corners become sectors of a sphere. A polishing wheel the face of which is rounded to the same radius as the radius of the wheel will then polish the inside of the edges *a-b*, *b-c*, *c-e*, etc., and make perfect contact with the entire surface of the spherical sector forming the corners.

Fig. 7 shows two designs of connecting rod in which the polishing cost varies widely, due to a slight difference in design. Both rods required polishing all over. The deep channel on the two sides of the I-section presented the difficulty in connecting rod A. The bottom and sides of the channel could be polished easily by a wheel with an abrasive head on the face and both sides. Such a wheel would fail to reach into the corners, exactly as in the previous example. These corners could be finished by a felt bob, as shown, a slow and expensive operation. The connecting rod at B shows a design that permits of finishing in the channels with a single wheel. The web is swept upward to the sides of the boss, and a wheel of the same radius as the sweep can then traverse the rod from end to end.

The ordinary wall plate for electric switches, Fig. 8, is an instance of the effect of finishing against an edge parallel to the axis of the wheel. The

travel of the work in an automatic machine and the rotation of the wheel being as shown in *B*, the leading edge *a* will be rounded while the trailing edge *b* will remain sharp. While the design might have been changed to provide for rounded edges, the sharp edge was a commercial consideration which did not permit of change of design. The difficulty had to be overcome by other means in the polishing department.

Circular and cross-cut saws present another instance of working against an edge parallel, or nearly so, to the wheel axis. The effect here is to strip the wheel head. Here again design change is not possible, and the remedy lies in a change in polishing method. It is for this reason that the polish-

ing of circular saws by means of the set-up wheel has never been successful. Due to the fact that the angle of the wheel axis to the bottom of the sole plate would be continuously changing, a very complicated fixture is indicated, and one whose expense might be prohibitive even if the mechanical construction was satisfactorily worked out. Consequently, sole plate sides are very largely finished by hand. A very simple change in design, namely, making the angle between the side and bottom constant, will permit the side to be finished in a machine with a relatively inexpensive fixture.

In Fig. 9 at *B* are shown a half plan and two half sections of the cover. Here the problem is a trifle different. The side of the cover at the rear of the iron is straight, curving

body, the solder being run along the edges of the plate. The entire outer surface of the cylinder requires buffing. The work is done by hand, although a cylinder usually is one of the easiest forms to handle in a machine. However, the projecting edge, formed by the seam, and the rivets soon would tear the buff to pieces. The nozzle outlet absolutely precludes finishing the doomed top in a machine. Finally, and perhaps most important of all, is the instruction plate. The extinguisher must be buffed *after* this is soldered on, since the rough edges of the solder require smoothing down. The plate itself could not be separately buffed, as the lettering on it would be disturbed.

Fig. 11 shows a redesigned form

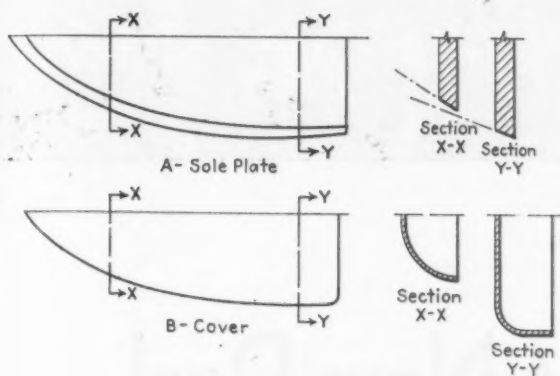


FIG. 9

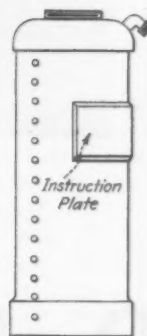


FIG. 10

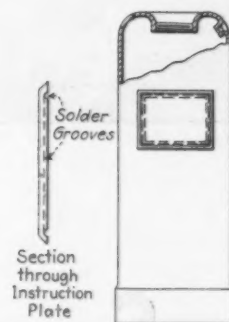


FIG. 11

ing of circular saws by means of the set-up wheel has never been successful.

Redesign of Flatiron

The housewife's ordinary electric flatiron is an excellent example of change of contour causing excessive polishing costs. These irons are produced in such large quantities that from the standpoint of volume alone they are an attractive automatic machine proposition. The two principal parts requiring polishing are the sole plate, on the bottom and edges, and the cover. The polishing of the bottom of the sole plate in a straight-line machine is comparatively simple. The edges in many designs have presented a most difficult problem, as have also the covers, both for the same reason. In Fig. 9, *A* is a plan of a sole plate and two end sections, at different points along the length of the iron. It will be noted that the angle which the side of the sole plate makes with the bottom is quite different at *XX* than it is at *YY*. A flat face wheel will traverse the edge from end to end, and thus would ordinarily present an easy problem for an auto-

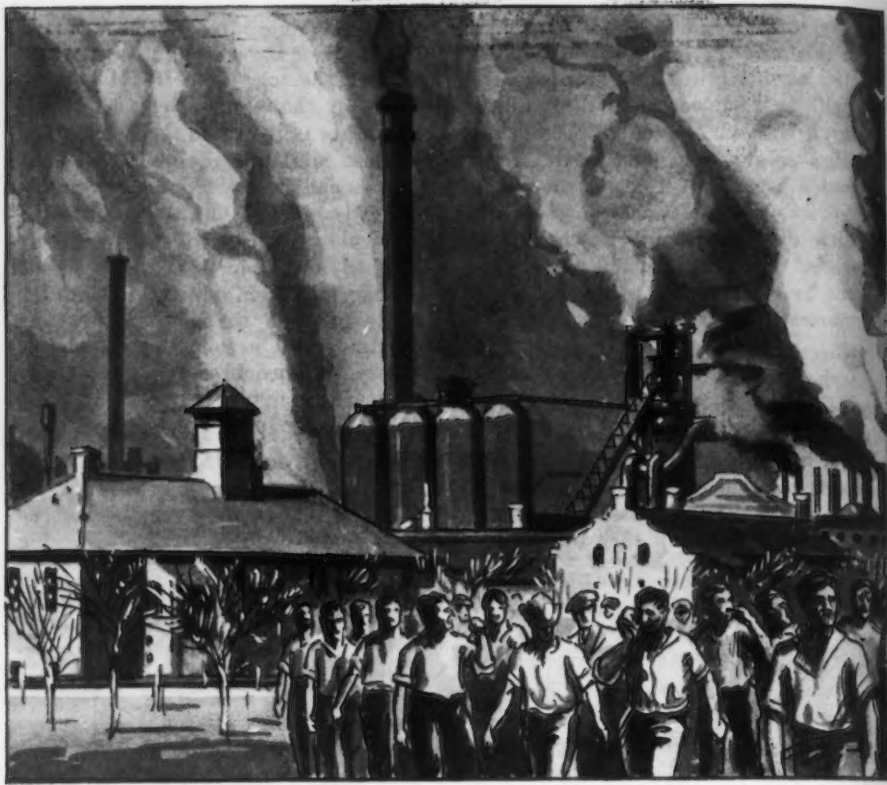
matic machine. Due to the fact that the angle of the wheel axis to the bottom of the sole plate would be continuously changing, a very complicated fixture is indicated, and one whose expense might be prohibitive even if the mechanical construction was satisfactorily worked out. Consequently, sole plate sides are very largely finished by hand. A very simple change in design, namely, making the angle between the side and bottom constant, will permit the side to be finished in a machine with a relatively inexpensive fixture. The problem introduced here is not only one of fixtures but of the wheel as well. It is manifestly impossible to build a wheel that will traverse the side of the cover from end to end, and at the same time come in contact with all parts of its surface. The remedy here is the same as before, viz., a new design that gives a constant angle and a constant radius throughout the length of the cover.

Projections Are Hard to Buff

The example selected to illustrate the adverse effect of projections lies in the field of buffing. The ideas suggested will apply equally well to polishing. Fig. 10 shows the common 2½-gal. fire extinguisher. As ordinarily made, it consists of a copper sheet formed into a cylinder, a line of rivets extending along the line of the seam. A domed top, with a hose outlet projecting from it, is fitted to the cylinder. The bottom also is a separate piece fitted in. An instruction plate is soldered to the cylinder

that permits the use of an automatic machine to effect a very great reduction in cost of buffing. The body of the extinguisher is formed of a seamless drawn brass shell without projections. The opening at the top is flanged inward and threaded for the cap. Likewise the hose outlet is flanged inward and threaded on the inside. There is thus no obstacle whatever to the use of a machine. The instruction plate is put on after the extinguisher has been buffed, in such a way that no finishing of the edges is necessary. A groove is cut round the periphery of the plate and filled with solder. After the cylinder has been buffed, the plate is laid on it and an electrical heating pad applied to it until the solder has melted and the plate has attached itself to the cylinder.

The foregoing are a few typical examples of ways in which the designer can reduce costs in the most expensive department of the plant. The opportunities before him are legion if he will only look for them.



Square Deal, Not New Deal, In This Plant

PERSONAL contact as well as friendliness and close relationship between employer and employee have proved their value, as exemplified by the depression experience of a medium sized Midwestern metal-working plant. One important point learned is that rigidity of plan may actually be a detriment. At the shop in mind, working details have been varied as occasion arose, but the basic idea of cementing close friendship has not been changed since the business was started in 1881. On first impulse it may be countered that such an idea, though desirable, is not practicable except in the smallest of plants. The answer is that this plant employed almost 800 men in 1929 and, therefore, if the desire and proper attitude are present, the plan can be

made operative in the vast majority of American shops.

It is not to be expected that this plan can be put in operation over night, or by operators who are unsympathetic or who by training are slow in grasping the underlying principles. In the case in mind the originator of the business held it to be a truth that the working man was usually on the weak end of an argument. Out of fairness this employer habitually sided with the working man until it was proved that he was taking the wrong stand.

Accordingly, at the inception of this business it was declared policy to have no policing. There are no signs about the shop that give orders. It is admitted that once in a while tools will

be missed, but it has been found that honesty among workmen is actually promoted by giving them freedom, and the experience of this company after more than 50 years tends only to establish the policy more firmly.

Overcoming Prejudice

The founder believed that all men tend to gravitate to one side or another of questions of major importance. Having once taken a stand a man will naturally view with some contempt not only opposite views but possibly also the men who hold those opposite views. This quite evidently is a human instinct. Therefore, as a matter of harmony within the shop, it has been a practice to bring together workmen and their supervisors who will not divide into factions through



argument, or previous prejudice. One outgrowth of this policy has resulted in a shop manned by American citizens. This is not looked upon as discrimination against foreigners, or any other group, for it is contended that any other group brought together under similar circumstances would bring the same degree of harmony.

How this plan worked during the depression is now a matter of record. Up until 1928 the company sponsored a mutual benefit association to which the company and workmen contributed. It paid in case of sickness and there was also a \$150 death benefit. However, it became apparent as time went on that the mutual association had inherent weakness that could not meet many new situations. There were, for instance, some old employees who were off the payroll and who were in desperate need. Others, though still on the payroll, had incomes that were totally inadequate. Inequalities multiplied as the depression advanced.

A Relief Plan

The company has contributed liberally to State relief. A study of this situation revealed that by the very character of public disbursement of relief funds it was hardly to be hoped that more than 50 cents of each dollar would actually reach the distressed. Further, red tape, pride and other uncontrollable factors prevented

fair help to the company's own distressed employees.

It therefore seemed entirely consistent for the company to undertake the care of its own needy and at the same time make case studies and lend help in many instances where a family, though in distress, was not eligible for State relief. Accordingly a committee was formed, consisting of a superintendent, a man from the shop and the treasurer of the company. The superintendent and the shop man were constituted a committee to investigate every case of distress. Funds were furnished by a donation from the company. The workers were invited, not forced, to contribute to this fund. It is inter-

By **ROGERS A. FISKE**

Western Editor, *The Iron Age*

esting to note that this invitation brought to light some cases of distress among those on the payroll.

If an employee was helping at home he was told frankly that he was doing his share and that he was not expected to contribute. In fact, each case was so handled that all fear of compulsion was dispelled and the worker had no fear of losing his job if he did not or could not contribute. If he could and did contribute he was given credit in such a way that he took pride in his ability to help.

Questionnaire Develops Information

Each employee, both those working and those temporarily laid off were asked to fill out a questionnaire, which along with personal contact by the relief committee brought to light

THIS is the story of a mid-western metal-working plant in which the old deal was a square deal. Its management consistently cultivated friendly relations with employees. It had the temerity to take a real and active interest in the welfare of employees; something that under Section 7a would probably be labeled undue influence and interference. Of course such conduct is not news to *IRON AGE* readers, for many employers in our industry have taken the same attitude. However, details of the plan are interesting and original. Also, perhaps some of our brain trust will find news in the fact that it is possible to conduct industry without instigating class antagonism.

the status of the workers. In one instance the family was in fair circumstances but three small girls needed milk. The dairy company was ordered to leave so much milk every day. Shop men, often poor bargain-ers, were in some instances being imposed upon by landlords in such a way that the workmen were steadily going into debt for rent. The committee tried first to have the rent lowered. If that failed it found other suitable quarters at lower rent and sent a company truck to move the furnishings. A matron visited children and a company doctor administered medical care. The fact that an employee owned property was no argument against his receiving the attention of this committee, which set out to assure necessary food, shelter and warmth for all it could reach.

Report on Each Case

The relief committee's questionnaire was designed to be in effect a report which formed the nucleus of a complete record of each case. A check was made on the number of children and their condition as to nutrition, clothing, etc. This brought to light the physical condition of the family, the physical assets, indebtedness and

other obligations, such as dependents other than wife and children. It was determined whether a worker belonged to a labor union, lodge or church. If so, that agency was advised of all findings and conditions and its aid was solicited to help meet the emergency. As important as any part of this work was a thorough follow up system. At first some men felt that the questionnaire was an effort on the part of the management to pry into personal affairs. However, this resistance was soon broken down and the men swung to the other extreme of bringing in all their troubles. This attitude was encouraged because it helped to establish another close tie between the management and the men.

No Solicitation Permitted

It may be well to mention that no solicitation is permitted in the shop. This is not a rule adopted as a blind to forestall labor trouble. It is adopted to protect the men against loan sharks, gyp agents, insurance salesmen, etc., and even solicitors for bank savings accounts. It is felt that should a man buy something when on company property and later feel he had been deceived as to its value, he might conclude that the company was in part responsible. Further, this rule forestalls thoughts of insecurity of jobs depending on the men's contributions to this or to that, or concerning their attitude toward saving, etc. The actual attitude of the company is that it wants to help the men with their problems both inside and outside of the shop, but it does not pry into any part of a man's private affairs unless it is discovered he is in distress, or unless he brings the problem to the company. Problems brought to the company are freely discussed and if aid, or advice, can be given it is done so on a man-to-man basis.

Payroll Inconsistencies

Checks having been made on the workers' home problems, attention was then given to payrolls. Where inconsistencies were found they were rectified as far as possible. Here was a man with four children earning on part time \$600 a year. Surely not enough to live on. Another man with only a wife dependent on him was earning more than the above sum. These men could trade jobs and the picture would be more equitable. A single man could give way to a man with a family. A family man on a meager job could be trained in a short time to hold a better job, and so increase his income. The problem was attacked from the angle of better

APPLICATION FOR LOAN

From _____

We, I, the undersigned do hereby make application for a loan of _____ Dollars () which is to be used for the purpose of paying.

(Nature of Debt)	to	(Creditor)	\$ (Amount)
_____	to	_____	\$ _____
_____	to	_____	\$ _____
_____	to	_____	\$ _____

We, I, own the following property, _____ valued at \$ _____ (Face value)

(Description of Property)

1ST Mortgage of \$ _____ held by _____

2ND Mortgage of \$ _____ held by _____

and _____ valued at \$ _____

1ST Mortgage of \$ _____ held by _____

2ND Mortgage of \$ _____ held by _____

(List any other property on reverse side of sheet.)

We, I, agree to pay this loan back at the rate of \$ _____ per _____ beginning _____

Signed _____

Dated _____ Witnessed _____

Workers could arrange for loans, without interest, payable in 10 or 12 monthly installments. ▲ ▲ ▲

equalization of the funds that were available for distribution through the payroll. There were a few cases of discontent, but by far the vast majority of workers saw the equity of the undertaking and have been consistently whole-heartedly for the plan. During and after this adjustment there was no slackening of the efforts and the help from the relief committee. It continued to make case studies and extend help both to employed and to workers who were prevented by business conditions from being on the payroll. There was no hesitancy to give employment when practicable to the wives or daughters of deceased workers.

While the above work was going on it was discovered that there were legitimate cases when a worker was justified in seeking a loan. To protect him from loan sharks the company set aside a sum of money available for this purpose. No interest

charge was imposed and the worker agreed to pay back the loan in installments extending over a period of 10 to 12 months. This plan helped immeasurably in meeting back taxes on real estate and personal property and in cases of severe illness.

Emergency Past Now

The emergency has passed for this company. Funds are no longer being solicited for the relief committee, which still has some cash on hand which is being used as needed. Experience disclosed the weakness of the mutual benefit association which has been abandoned in favor of group insurance with one of the strongest companies in the country. The company wants the best possible assurance that mutual benefits can be extended in bad as well as in good times. Approximately half of the cost of insurance is paid by the workers and half by the company. Each work-

man is ability \$1,000. nity cla dental c This has suc tive pla ceeds th a bonus company, a piece unless changed makes f pected h burden departm error a repetitio The c room, of A man bring hi dining r buked in

RELIEF COMMITTEE REPORT OF

Case No. _____
Date _____

Name _____ Age _____ Name _____ Age _____
(Surname) (Man's Name) (Woman's Name)

Where born? _____ U.S. Citizen? _____ Occupation _____

Address _____

Since _____ Previous Address _____

Number of children			
Boys' Names	Ages	Girls' Names	Ages
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Other dependents: _____

Date of last employment _____

Sickness in family? _____

Name of Doctor attending _____

Member of what Labor Union, Lodge or Church _____

Ex-service man? _____ Date Discharged _____

Own or rent home? _____ Own Real Estate? _____

Landlord _____ Rent _____ Owes Rent _____

What income in form of wages, pension, alimony or any other form? _____

What relief received during past 60 days? _____

What relief is necessary? _____

Remarks _____

Recommendation of Investigating Committee _____

Signatures of Investigators _____

Action Taken _____ Follow Up _____

▲ ▲ ▲ This form was used by the relief committee in making its case studies.

man is protected for 12 weeks of disability and by a death benefit of \$1,000. There is also a double indemnity clause providing \$2,000 for accidental death.

This is an open shop, and since 1919 has successfully used a labor incentive plan. The good worker who exceeds the minimum and thereby earns a bonus gets the entire bonus, the company not asking for a split. Once a piece rate is set it is never changed unless the method or tools are changed. If on bonus work a man makes far above what had been expected his job is not changed, but the burden is placed on the time-setting department which is charged with an error and steps are taken to avoid repetition.

The company maintains a dining room, open to all on an equal basis. A man may buy his lunch there or bring his own lunch and eat it in the dining room. No employee is ever rebuked in the presence of others. This

is considered a private matter which is handled privately. Picnics are held in the summer time and in the winter dances are given in a respectable hall. Long friendly relations between employers and workmen are thus reaffirmed. Officials get to know the families and all of this is done strictly on a man-to-man basis. Christmas parties for the children are carefully planned so that no matter what the condition in the home may be no child misses a visit by Santa Claus. A matron helps the girls with their problems and by her close contact is quickly able to detect the girl who tends to lower the mental attitude and thoughts of her companions.

Harmony is the keynote of the entire plan which acknowledges that men are men regardless of their station with the company. The management does the things that are necessary to help its workers over the humps of their difficulties. The proof of effectiveness lies in the fact that

labor turnover is extremely low and the average length of employment is correspondingly high.

Chambersburg Engineering Develops Cocolloy

CHAMBERSBURG ENGINEERING CO. of Chambersburg, Pa., has developed a series of synthetic nickel-molybdenum, air-furnace iron alloys, which have been grouped under the trade-name of CECOLLOY.

While similar alloys have been used in smaller castings, particularly during the last few years, Chambersburg found no previous data available on castings as large as those required in hammer practice.

The development of Cocolloy came through the metallurgical research undertaken by the company's engineers during the depression, in the desire to increase the production capacity, increase the accuracy and reduce the maintenance cost of the forging hammer. This research pointed to an ideal metal for anvils and frames, combining the mass and vibration-resisting properties of gray iron with the strength and wear-resisting properties of steel, yet free from the deficiencies of both these metals.

Early in the research, it was discovered that the characteristics of the ideal alloys could not be produced in a cupola furnace. This reduced the field of melting equipment to either electric or reverberatory type furnace.

Being interested largely in heavy-section castings, which can be produced most economically in the reverberatory type of furnace, the Chambersburg engineers concentrated on the development of such a furnace, specifically for the production of high strength alloys.

This new type of air furnace, now in operation is capable of maintaining the exceptional temperatures necessary during the rather extended period of carbon conversion, which is a fundamental requisite of high strength iron alloy.

The chief characteristics of Cocolloy are a fine, homogeneous grain structure, a tensile strength of from 40,000 to 60,000 lb. per sq. in., and a Brinell hardness which can be controlled in the furnace to suit the purpose for which the casting is intended. Carbon content can also be controlled within 0.05 per cent plus or minus.

Cocolloy finishes with a clean, smooth surface, the result of its fine, graphite-free grain structure. Its cost is naturally higher than gray iron, but much less than steel, over which it is said to have many advantages, in certain applications. Castings of this material have been produced weighing 50 tons.



In the two hopper cars shown, which were built of high-tensile, corrosion-resistant steel, the ratio of live load capacity to dead weight has been materially increased.

New Materials Used in Baltimore & Ohio

THE most famous ratio in American history was 16 to 1, which became familiar to man, woman and child back in the '90's. Today another ratio—5 to 1—is becoming just as well known on the Baltimore & Ohio. And this new ratio, be it observed, is not a panacea. It represents a bogey set up by railroad men who are well aware of practical possibilities.

The ratio set up for the Baltimore & Ohio was 5 tons of revenue freight for every ton of dead weight in a car. At the time the bogey was established, several years ago, the ratio of revenue load to the light weight of open-top cars was less than $2\frac{1}{2}$ to 1 and even today there are few cars in which the ratio approaches 3 to 1.

The problem posed for itself by the B. & O. was essentially one for the mechanical department to solve. At first an effort was made to improve the load ratio by increasing the size of equipment. In 1929 the Baltimore & Ohio exhibited a 95-ton steel hopper car at the Atlantic City convention of the American Railway Master Mechanics' Association in which the ratio of the maximum load to the light weight was raised to 3.34 to 1. In 1932 a sample all-welded hopper car of 70 tons capacity was constructed by the railroad. The light weight of this car is 45,400 lb. as against 55,400 for

the riveted car of the same size, a saving of 10,000 lb.

Lighter Materials Used

Later the Baltimore & Ohio mechanical department turned its attention to lighter materials. In February of this year it built a hopper car of aluminum alloy. Except for the wheels, axles, conventional brake beams and cast steel side frames, all of the material used was aluminum alloy. The light weight of this car is 27,700 lb. The inside dimensions of the car are 35 ft. by 10 ft. 2 in. The length of the car in train is 38 ft. 6 in. The load limit is 141,300 lb.

In May two hopper cars were constructed of Cor-Ten, a high-tensile corrosion-resistant steel. In these cars all of the material used was Cor-Ten except the wheels and axles, and the side frames and bolsters, which are of special light-weight design and constructed of heat-treated alloy cast steel.

One of the Cor-Ten cars, N-30, is of conventional type, having no end hoppers or doors. The other, N-29, is arranged with conventional cross hoppers at the middle of the car and hoppers at the end with end dump doors.

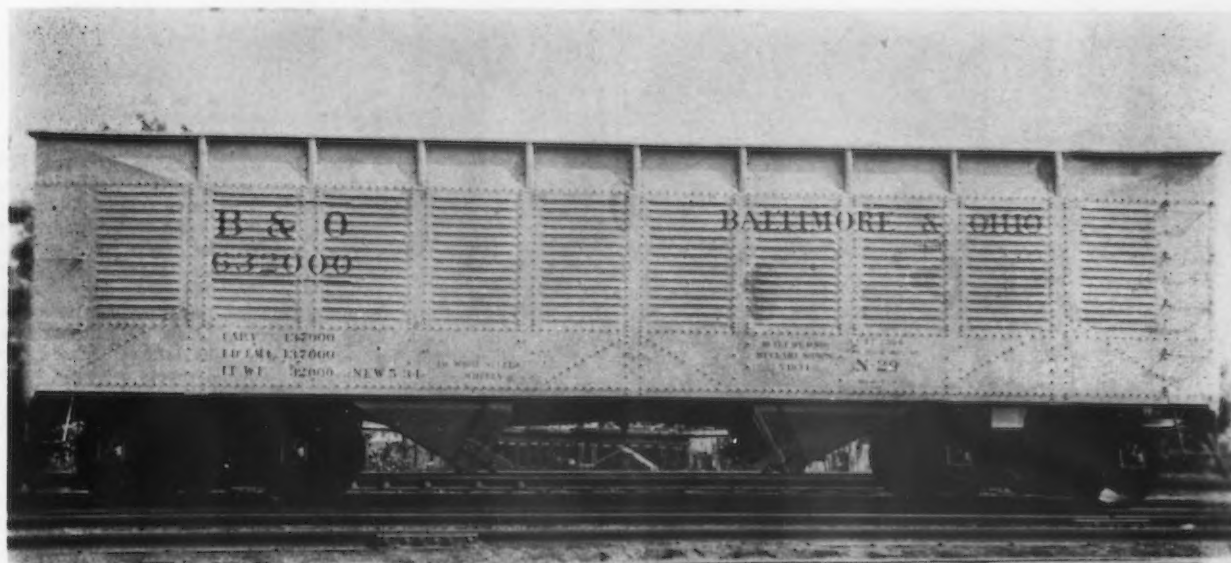
N-30 has inside dimensions of 32 ft. 2 in. by 10 ft. $3\frac{1}{8}$ in. The length in train is 36 ft. $5\frac{1}{2}$ in. The load limit

is given as 137,800 lb. and the light weight is 31,200 lb., making the ratio of revenue load to light weight 4.42.

The inside dimensions of N-29 are 34 ft. $11\frac{1}{8}$ in. by 10 ft. $3\frac{1}{8}$ in. The length in train is 39 ft. $3\frac{1}{2}$ in. The load limit is 137,000 lb. and the light weight is 32,000 lb., making a ratio of load to tare of 4.28.

There are freight cars built of aluminum alloy that antedate the Baltimore & Ohio car, but so far as is known the two cars built of Cor-Ten are the first to be constructed anywhere of high-tensile corrosion-resistant steel. In both cars the sides consist of $3/32$ -in. corrugated panel sheets with side sill $\frac{1}{8}$ in. thick and with a top chord of $3/16$ -in. plate pressed into the shape of a channel. Top and bottom stiffening plates and inside pressed steel side stakes are $3/32$ in. thick. Floor and hopper sheets are $3/32$ in. thick.

The materials are joined together by riveting, as was the case also with the aluminum alloy car. Standard practice was followed in handling the steel and no difficulties were encountered. The side sheets had to be corrugated to give the steel the stiffness and resistance to bulging lost through reduction in thickness. The corrugating was done by the railroad on a 1500-ton hydraulic press with dies and guide posts made especially for the



Ohio Freight Cars

By G. L. LACHER
Managing Editor, The Iron Age

job. Welding was employed to seal up the corners and to make the hoppers tight. No trouble whatever was experienced in the welding. In fact, ordinary coated welding rods were employed, although Cor-Ten welding rods can be obtained.

Eight Per Cent Increase in Live Load Capacity

In this pioneer experience in the construction of cars with high-tensile steel it has been demonstrated that an increase of 8 per cent in live load capacity can be effected. The Cor-Ten cars have 5½x10-in. axles and journals for which the permissible load limit on the rails is 169,000 lb. Taking N-29 as an example, the light weight of the car is 32,000 lb. and the loading capacity is 137,000 lb., or a total of 169,000 lb., which is the load limit on the rails. A 55-ton carbon-steel car with the same load limit on the rails would weigh about 43,000 lb., allowing 11,000 lb. less revenue capacity than the Cor-Ten car. The increase in live load capacity effected by the use of Cor-Ten is therefore 5½ tons. Just how a larger Cor-Ten car, with 6x11-in. axles and journals and a load limit on the rails of 210,000 lb., would compare with a carbon-steel car of that size cannot be accurately forecast pending the construction of such equipment, but there is no reason to

Five-to-One Ratio Is New Bogey in Equipment

FIVE to one—5 tons of revenue freight to every ton of dead weight in an open-top car—is the bogey of the Baltimore & Ohio Railroad. In pursuit of this aim several sample cars have been built of corrosion-resistant materials in which the dead weight has been materially reduced. At the same time the railroad has made an investigation of the relative influence of atmosphere and lading on corrosion and has found a surprisingly large proportion of rust loss due to the former.

doubt that it would show an equal, if not larger, ratio of saving.

The increased revenue load that can be handled by the high-tensile steel car represents a net saving, because the cost of construction is no more than for a plain carbon steel car of like capacity. The high-tensile steel costs about 4c. a lb., but the increased cost of material, it is stated, is offset by the reduction in the weight of the steel required.

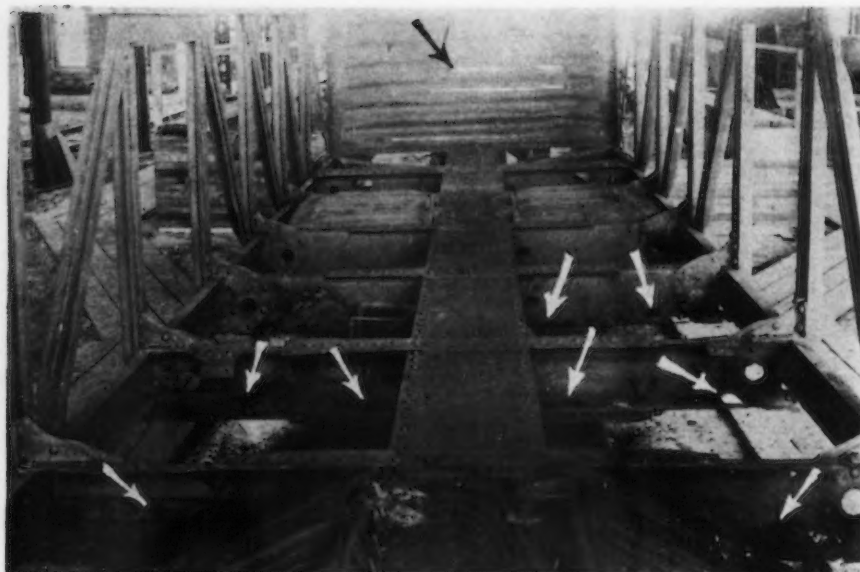
A marked saving in light weight

also has been effected in a high-tensile steel box car which, like the three sample hopper cars, is on exhibition at the world's fair at Chicago. Through the use of Cor-Ten the weight of this box car has been reduced from 46,500 lb. to 37,500 lb. In addition, the capacity in volume was increased from 3320 cu. ft. for an A.R.A. standard car to 3390 cu. ft.

A feature of the construction of the three Cor-Ten cars is the inclusion of Duryea cushion underframes. This type of underframe is considered essential for light-weight cars because, due to its large cushioning capacity with low end forces, it relieves the bodies of heavy buffing stresses and end shocks, and less material can be used. The Baltimore & Ohio already has 10,600 copper-bearing steel cars of both box and open-top type so equipped. With the heavy standard cars of conventional design end stresses frequently shear the rivets. In fact, the Baltimore & Ohio estimates that at least 80 per cent of their conventional cars on repair tracks got out of order because of the body shifting on the underframe.

Large Part of Corrosion Due to Atmospheric Exposure

The light car body of the new Cor-Ten car necessitates the use of a 3/32-in. plate, as compared with a ¼-in. plate in most carbon steel cars. With



the adoption of so light a plate, corrosion became an important problem. Previously little was actually known about the causes of freight car corrosion. The makers of Cor-Ten believe that their material eliminates all atmospheric corrosion and are making exhaustive studies of its resistance to the corrosive action of coal in the car, particularly mine water drippings from the coal.

Atmospheric conditions, according to investigations made to date, account for fully 80 to 90 percent of the corrosion in open-top cars. At first it was thought that serious atmospheric corrosion occurred only at seaboard points, where the steel was exposed to salt air, but now no such exception is made to the general conclusion. The reason lies in the experience of the railroad with 1800 cars of the gondola type that have been stored at Bloomington, Ill. Three years ago inspection disclosed that this equipment was in first class condition. Today the cars are badly rusted. The full extent of the corrosion was uncovered by sandblasting, some of the holes eaten into the steel being shown in the illustrations. Paradoxical as it may seem, equipment stands up better in use than when idle. The scouring action of the lading prevents the rust from accumulating on the sides of a car.

Influence of Lading on Corrosion Being Investigated

Two forced corrosion tests are now under way at the Mount Clare shops of the Baltimore & Ohio at Baltimore. Two hopper cars have been loaded with the highest sulphur coal obtainable and are given an inch of artificial rain once a week. The water is applied by means of a sprinkler system and its distribution is uniform. In

one of these cars the railroad has placed various types of side plates, including Cor-Ten, aluminum alloy, copper-bearing steel and ordinary carbon steel. The test on the other car is being conducted by the United States Steel Corporation, which has inserted stainless steel, Plykrome, Cor-Ten and Man-Ten side plates against the lading. At the end of three months—two months had elapsed at the time of writing—the plates will be weighed and the loss from corrosion will be computed.

The use of corrosion-resistant materials in freight equipment, it should be borne in mind, is not dictated by the need of increasing the life of cars. It is solely for the purpose of reducing the dead weight in rolling stock. The life of present equipment is entirely satisfactory, but long life has been attained by using thick material. In other words, extra weight has been put in to compensate for the amount of material that will later be lost through corrosion.

To illustrate the point that length of life is not an objective, a chapter from the Baltimore & Ohio's own experience may be cited. In 1920 the railroad had 3000 cars out of service which were 10 years old, and there was not a single car that could not be looked through. These were rebuilt with $\frac{1}{4}$ -in. copper-bearing plates and put into service in 1921. This steel had a copper content of $\frac{1}{4}$ of 1 percent and is believed to have been the first copper-bearing steel used in freight equipment in this country. These cars have been running ever since and probably have 20 years of service left in them—provided, of course, that the railroad regards it economical to continue to operate them.

The dead weight represented by the

THE Baltimore & Ohio has had 1800 open-top cars stored at Bloomington, Ill., for the past three years. At the beginning of that period in first-class condition, these idle cars have suffered greatly through long exposure to the atmosphere. The full extent of the ravaging effects of corrosion was uncovered by sandblasting. How the rust has eaten through side sills, stakes, braces, diaphragms and end sheets is shown in the illustrations.

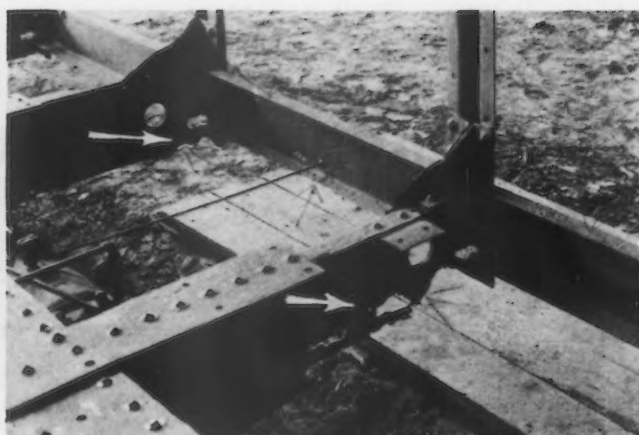
difference between $\frac{1}{4}$ -in. carbon plates and $\frac{3}{32}$ in. high-tensile sheets constitutes a non-productive load that must be moved over the rails, if the equipment is kept in use. And further reduction of the non-revenue load is the only road to the 5-to-1 ratio set up as a bogey by the Baltimore & Ohio Railroad.

In pursuing the goal, the Baltimore & Ohio is investigating the possibilities of all types of materials that look promising. And their work is being facilitated by the research and experimentation of producers of various materials. Undoubtedly still other forms of corrosion-resistant materials and high-tensile steels will be perfected in coming years and these will compete with those now in the field for the favor of the railroads and equipment builders.

Possibilities Opened by New Type of Equipment

The possibilities inherent in the reconstruction of the freight equipment of the country capture the imagination. Such a change-over would stimulate the steel and metal industries as nothing has since the steel freight car superseded the wooden car. The savings in weight achieved through the rehabilitation and rebuilding of cars would repay the capital invested in a very short time with an attractive profit. Thus the investment involved would be self-liquidating and would have none of the earmarks of many of the current emergency public expenditures which will burden the backs of taxpayers for years to come.

The pursuit of the 5-to-1 ratio, therefore, offers the railroads a way out of their dilemma. Barred from reductions in taxes and labor costs, saddled with an inflexible rate system and confronted with increasingly



severe competition, the reduction in costs which the 5-to-1 ratio would bring would put the railroads back into a position of unassailable financial security, according to the convinced opinion of enthusiasts.

Confidence in railroad securities

would be restored; insurance companies, saving banks and endowments which have large railroad investments in their portfolios would be greatly benefited. Employment would be stimulated. Producers of steel and other materials and manufacturers of

machinery would be assured a large and steady flow of business. In short, 5 to 1, if put into practice by the railroads at large, might give American industry the impetus that marks the difference between good times and dull times.

Million Dollar Arc Welded Steam Line

FORTY-TWO thousand eight hundred feet of underground arc welded steam lines now supply heat for U. S. Government buildings in Washington.

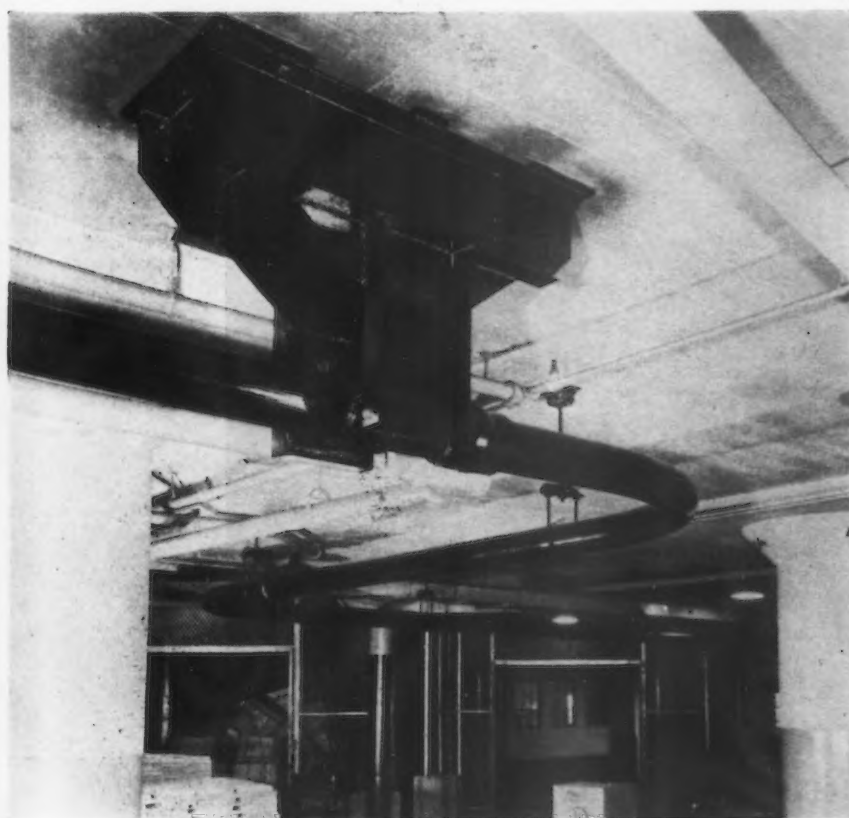
This gigantic piping system cost more than \$1,250,000. The contract

was awarded by the Treasury Department to the Northeastern Piping and Construction Corp., North Tonawanda, N. Y.

Most of the federal buildings in Washington, including the White

House, are now heated by steam from a district heating system.

The district served by the new system is bounded by Sixth Street, N.W., E Street, N.W., Twelfth Street, N.W.,
(Concluded on Page 82)



General view of 6-in. arc welded main in Federal warehouse.



Tunnel to new National Museum, showing 8-in. and 4-in. steam lines.

Machining Work on the Buick 40—II

A SPECIAL W. F. & John Barnes machine has been installed to bore and counterbore the transmission pilot hole and to face the center bearing of the cylinder block. This machine embodies a patented hydraulic system consisting of two pumps, one a geared type for imparting rapid traverse movements and the other a small radial plunger type for the feed movements. The pumps are controlled by a common hydraulic valve which is operated by dogs to change from rapid traverse movements to feed movements. The pump circuits are completely separated.

During the feeding movement of the unit, the high-pressure plunger pump operates directly upon the actuating cylinder without any intermediary relief, by-pass or bleed valves, only the required quantity of oil being pumped. The feed pump is driven direct by the same motor which re-

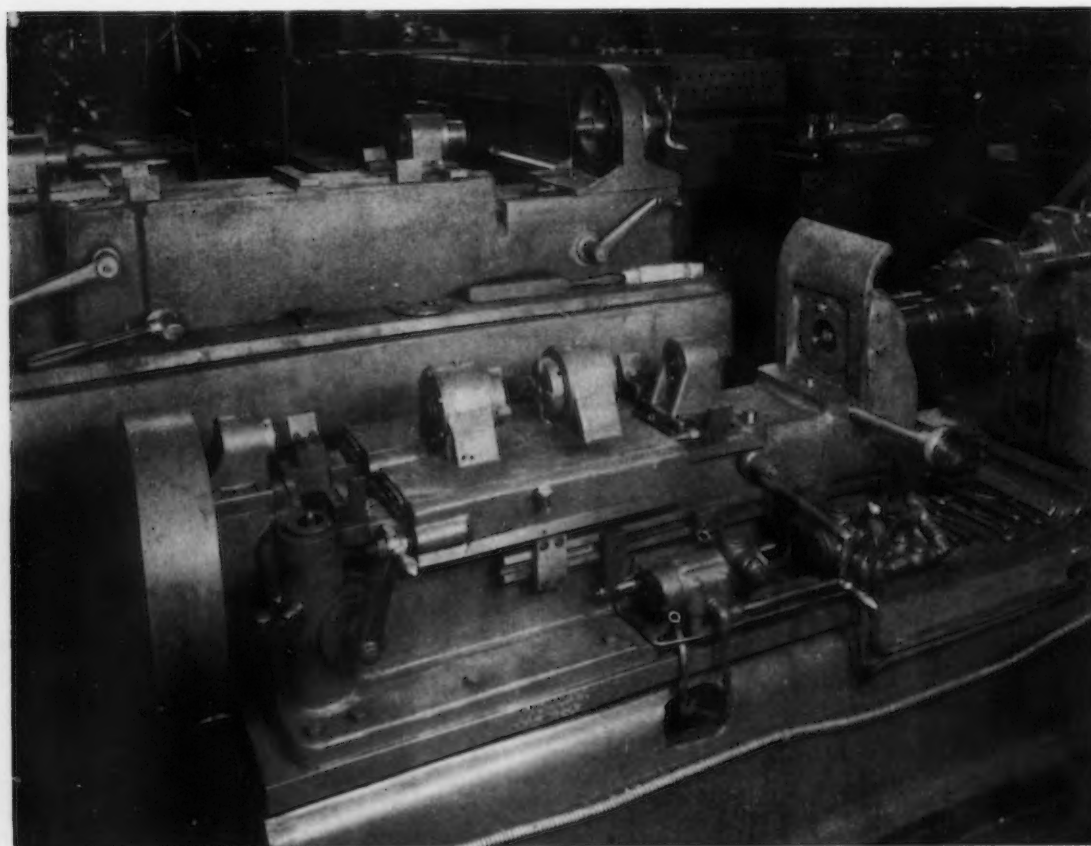
THIS article describes several unusual machining operations on the Buick 40 cylinder block and crankshaft. Buick recently installed the latest type equipment to get its production costs down enough to justify the low retail prices established for its model 40 cars. A previous article described equipment of new design for machining the cylinder block

volves the tool spindles. This arrangement insures a constant rate of feed per spindle revolution irrespective of the tool pressures encountered.

Tolerances are so close that the facing and counter-boring could not be controlled from a common source. The facing cut is taken by a hydraulically-actuated milling fixture which

receives oil for its operation from the same source as the square ram type unit used for boring and counter-boring. In the facing cycle, the milling cutters feed to a positive stop in one direction for facing one side of the bearing, dwell and automatically rapid-traverse in the opposite direction. They then strip to a slow feed and face the second bearing surface against a positive stop, dwell and automatically return to the loading position. The hydraulic pressure imposed upon the facing carriage is so accurately controlled and both dwells are so closely regulated that the bearing is machined within the specified tolerance.

At the same time that the facing operation is being performed, the control handle on the square ram unit at the right-hand end of the machine is moved into rapid traverse position. The spindle, equipped with boring and counterboring tools, then ad-

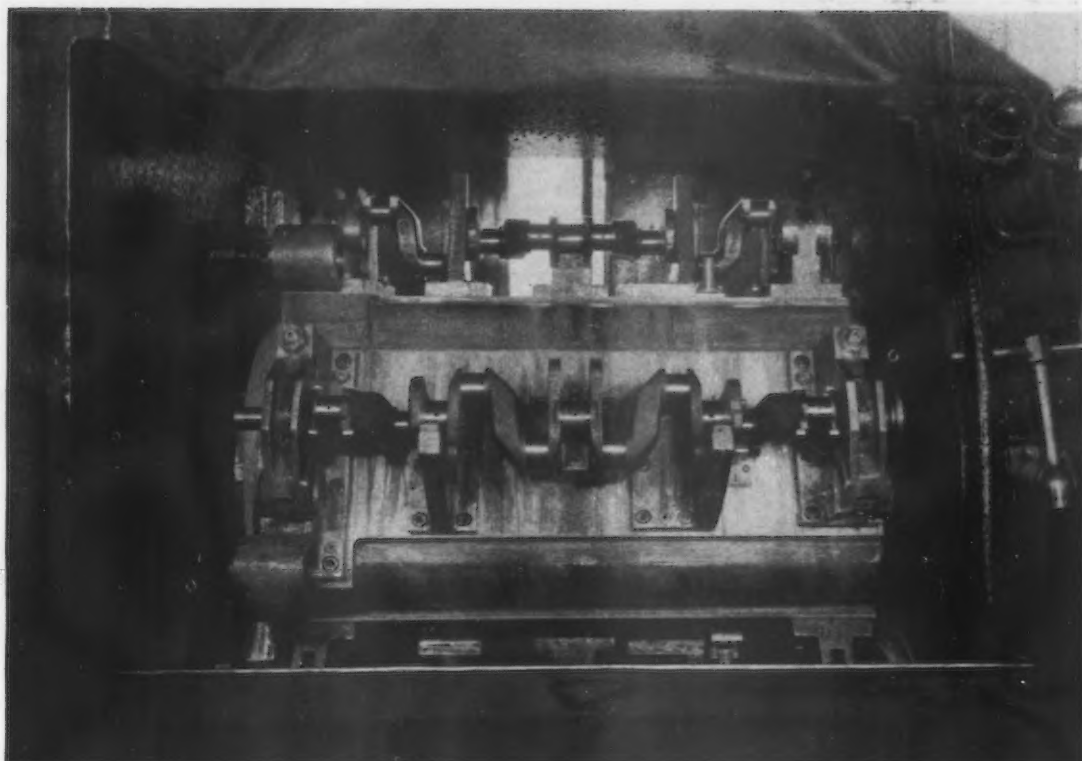


The transmission pilot hole is bored and counterbored and the center bearing of the cylinder block faced on a special W. F. & John Barnes machine.

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A number of drilling, chamfering, reaming, tapping and counterboring operations are performed on the crankshaft on a Natco two-way horizontal drilling machine arranged for semi-automatic hydraulic feed.

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milled face of the assembly to the dowel-holes, which are used for locating purposes.

The square ram unit is equipped with a single boring tool. However, the mounting face on the unit is large enough to accommodate multiple-spindle drill heads. The hydraulic

unit has a maximum stroke of about 12 in.

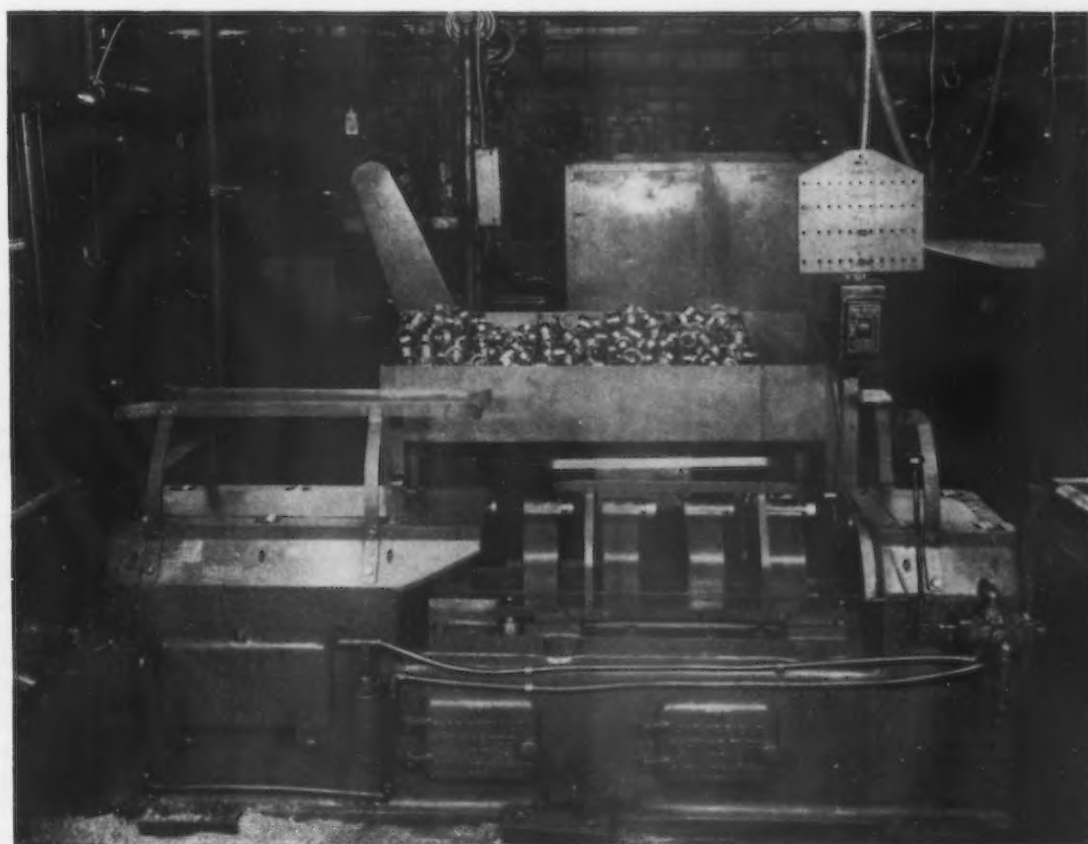
Assembling Camshaft Bearings

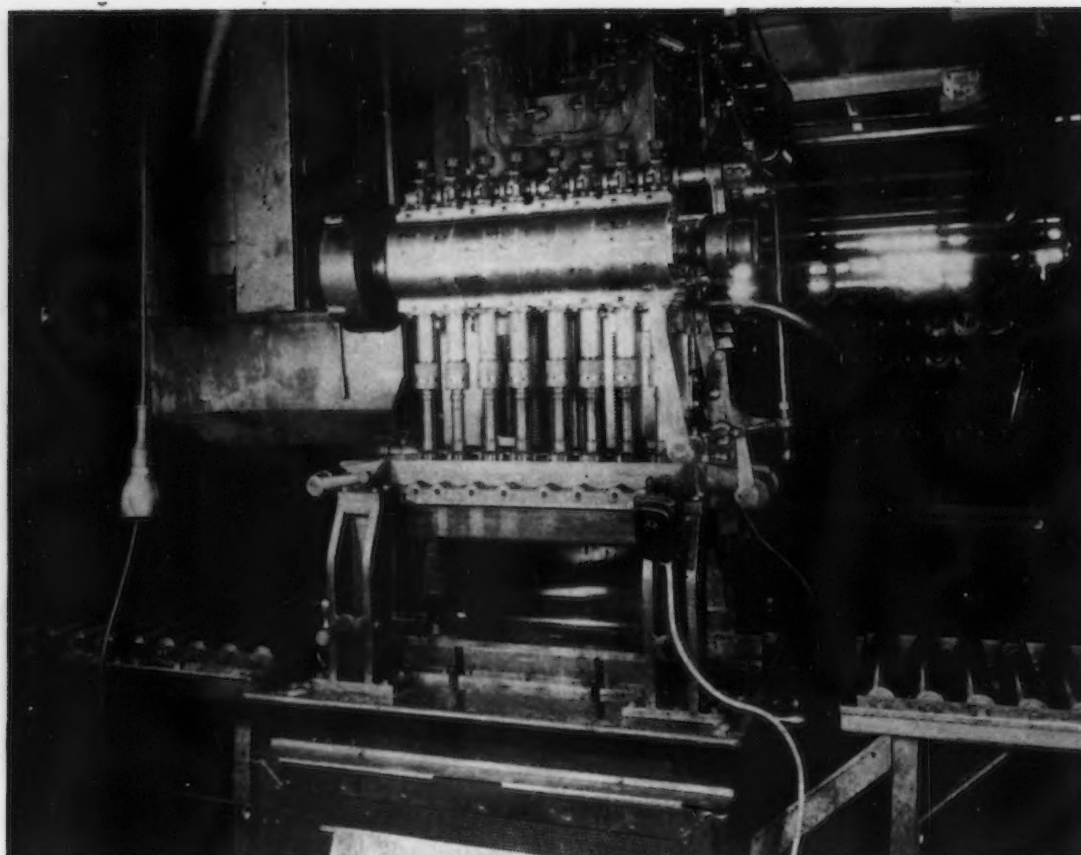
Camshaft bearings are assembled to the cylinder block on a Springfield special horizontal assembling or pressing machine. The block, travel-

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Camshaft bearings are assembled to the cylinder block on a Springfield special horizontal assembling or pressing machine.

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Cylinder bores are rough lapped on a Moline lapping machine.

Crankshaft rough a n turned on 5-AC

ing down a roller conveyor, reaches the left-hand end of this machine when the hydraulic elevating mechanism is in a raised position. The block slides down on to the rails of this mechanism, and the operator depresses a foot pedal. The mechanism lowers and, as it reaches the completion of the stroke, the work settles over fixed dowels into the dowel holes in the block. The control lever at the right side of the machine then is pushed by the operator, allowing the oil to pass into the cylinder on the left end of the machine. The ram is connected to the slide, of which five pendants are a part. The slide operates in carefully-prepared machined surfaces, an accurate location being maintained both in height and front-

to-back dimensions of the cam bores to the surface of the elevating mechanism and to the center of the two dowels.

Upon completion of the stroke, the operating lever moves automatically in the opposite direction, reversing the movement of the slide, which returns to its starting position. The elevating mechanism then is raised by an opposite movement on the foot pedal by the operator, the work being stripped from the locating dowels. When the elevating mechanism is completely raised, the work is slid off at the right side of the machine.

Interlocks are provided to prevent operation of the elevating mechanism during any incompleting part of the assembly operation and to eliminate

the possibility that the assembly movement might start except when the elevating mechanism is in its lowest position. Means are furnished for avoiding the building up of pressure beyond the predetermined point at the completion of the pressing stroke.

A number of drilling, chamfering, reaming, tapping and counterboring operations are performed on the Buick 40 crankshaft on a Natco two-way horizontal drilling machine arranged for semi-automatic hydraulic feed. The machine consists of one left and one right horizontal drilling unit, each equipped with a fixed center gear-driven cluster box containing 26 spindles mounted in anti-friction bearings with nose adjustment on the spindles. The machine also has a reversing motor-driven tapping unit containing one individual lead screw tapping spindle.

An automatic indexing trunnion type fixture with six positions is used. Each position holds a crankshaft. Each shaft is located in the fixture on the ground front and rear bearing and registers radially from one crank pin bearing. Operations of the various positions are as shown at left.

In conjunction with the modern machine tool equipment which has been installed for work on various parts of the model 40 car, Buick has

provided porting the next

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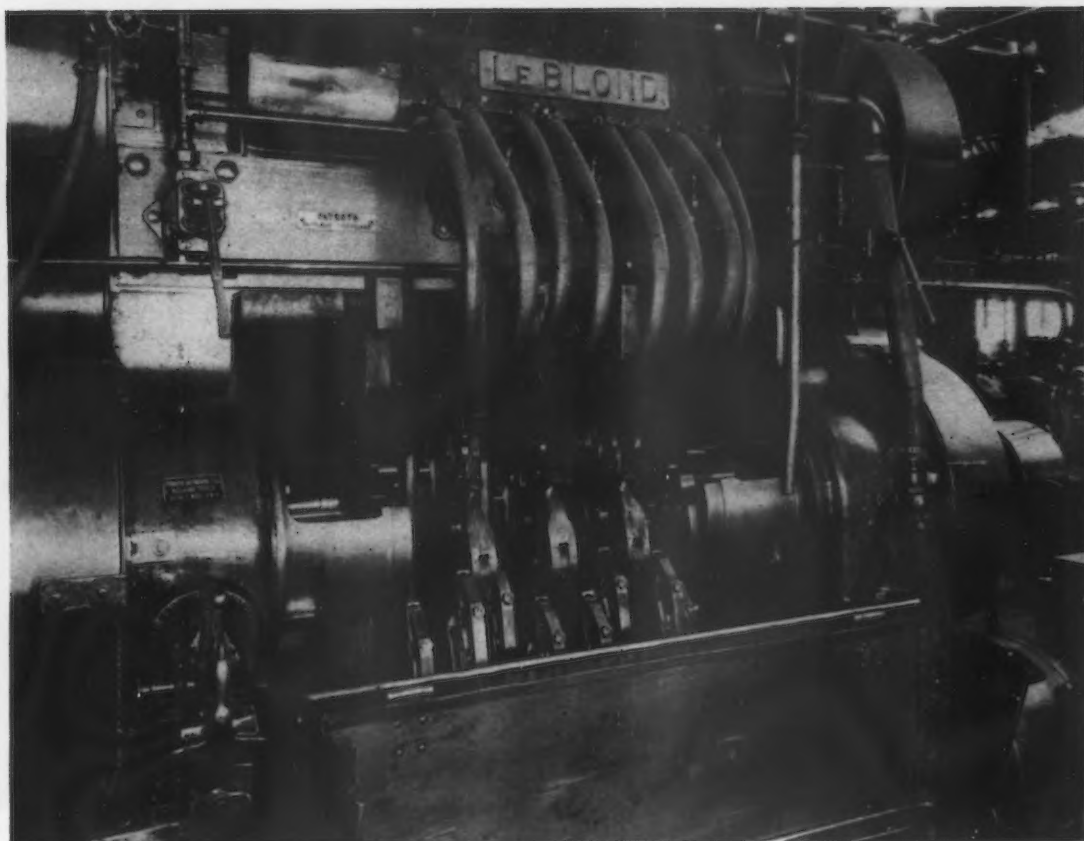
The 1 Motor brings to heretofore reference tion con and per motors, of both.

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Position No. 1	
Unload and reload one part	
Left-Hand Unit	Right-Hand Unit
Drill one 43/64-in. hole.	Drill six 23/64-in. holes in flange end. Center drill one 1 1/4-in. hole.
Position No. 2	
Position No. 3	
Chamfer one hole 13/16 in. in diameter at 60 deg. angle.	Chamfer six 23/64-in. holes Counterbore 1.3125-in. hole and chamfer.
Position No. 4	
Ream one hole to 0.6875 in. diameter.	Undercut one hole to 1.383/1.393 diameter.
Position No. 5	
Left-Hand Tapping Unit	
Tap one hole with 3/4-16 tap.	Counterbore one hole to 1.365 in. diameter. Finish ream two holes to 0.375 in. diameter. Finish ream four holes to 0.372 in. diameter.

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Crankshaft pins are rough and finish turned on a LeBlond 5-AC lathe.
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provided conveyors suitable for transporting work from one operation to the next with the greatest possible

ease and economy. Cylinder blocks move down a roller conveyor line during their machining period, many

of the machine tools being built into the conveyor line so that straight line movement of the block is not halted.

New "Nema Motor and Generator Standards"

SUPERSEDING and greatly amplifying the 1930 edition, the new "NEMA Motor and Generator Standards" is now published by the National Electrical Manufacturers Association.

The 1934 edition of the NEMA Motor and Generator Standards brings together much information not heretofore published and constitutes a reference work of practical information concerning the manufacture, test and performance of a. c. and d. c. motors, generators, and combinations of both.

The material presented is arranged in readily usable, quickly comprehensible form. The various kinds of motors, generators and combinations are treated in separate sections, each of which is practically complete in itself, and which makes it possible to find in one place most of the standards pertaining to a given kind of rotating apparatus.

A few of the major sections of the book are: Universal Motors, Small

D. C. Motors, Small A. C. Motors, Large D. C. Motors, Large Induction Motors, Large Synchronous Motors, A. C. Elevator Motors, A. C. Crane Motors, D. C. Generators, Synchronous Generators, Motor-generator Sets and Synchronous Motor-generator Sets.

Sections added to the 1934 edition of "NEMA Motor and Generator Standards" include:

Director-current Generators (General Purpose Sizes), Buffer and Grinder Motors, Motor-generator Sets (150 Kw. and Smaller), Motion-picture Motor-generator Sets.

The general sections of the new book and the section on definitions which defines over 150 terms used in dealing with motors and generators have been considerably amplified.

In response to requests received from many varied industries, the standardized mounting dimensions for motors have been included in the new publication. This makes it possible to obtain readily the standard mount-

ing dimensions for various ratings of large power d. c. motors, large power a. c. motors (single-phase and poly-phase), elevator motors and crane motors. Rules are given for determining frame numbers, and letters are provided for convenience in indicating the various mounting dimensions. Many motor manufacturers have been supplying motors in accordance with these standard mounting dimensions for some time, but this is the first time that this information has appeared in print.

The new book should prove useful to the consulting engineer, the machine designer, and the purchaser, since it sets forth in convenient form that which is adopted as standard for the industry.

The new "NEMA Motor and Generator Standards" contains 176 pages in strong flexible linen binding, size 8 x 10½ in. It may be purchased for \$2.00 per copy from the National Electrical Manufacturers Association, 155 East Forty-fourth Street, New York.

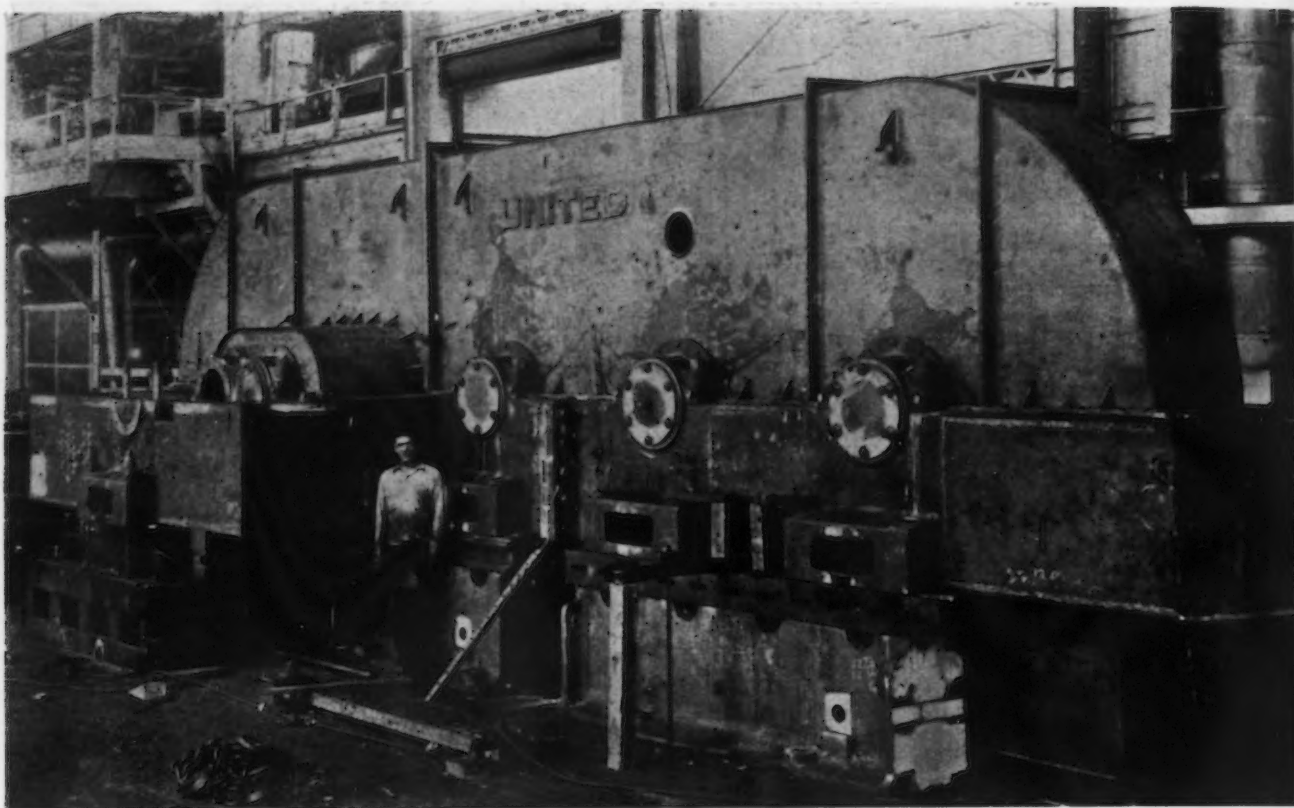
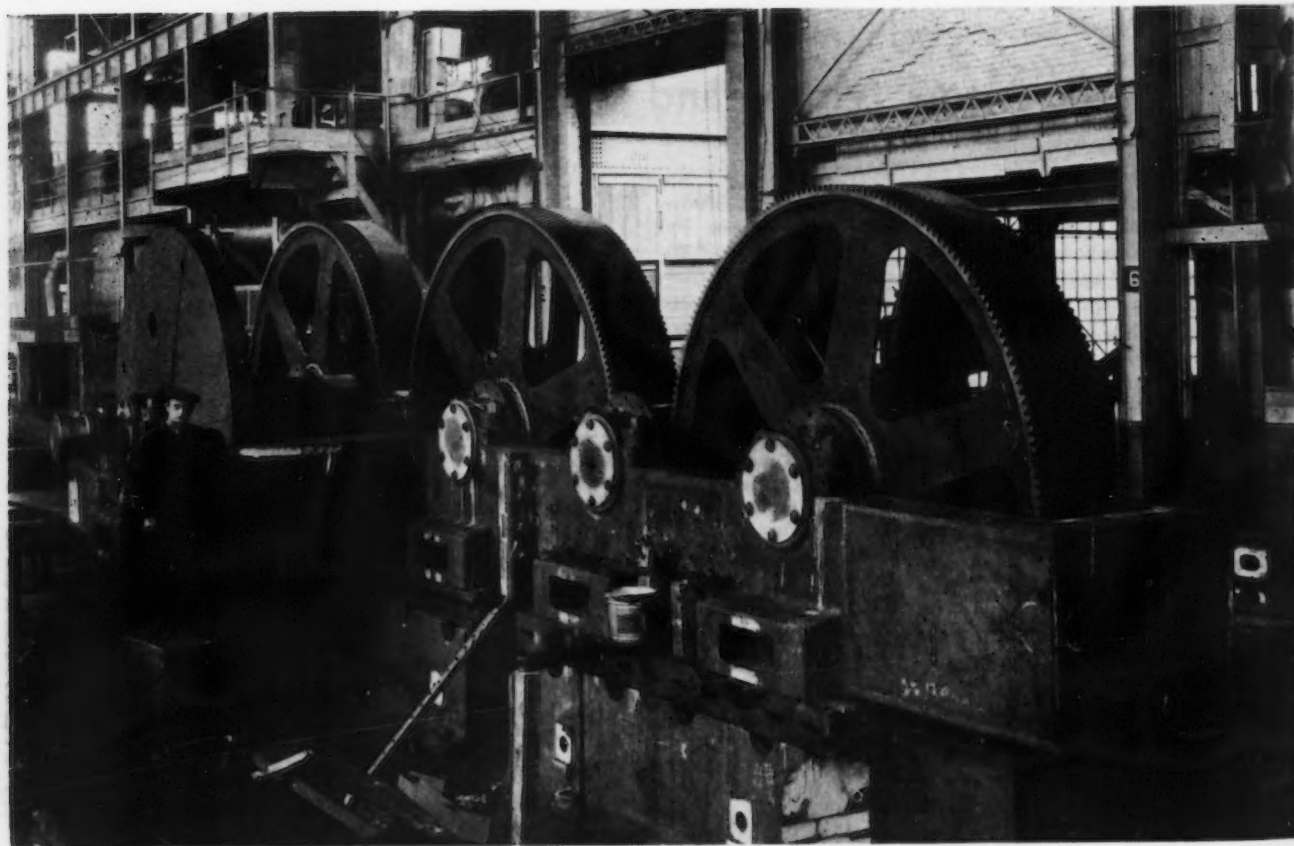


Fig. 1—This 1000-hp. mill drive weighs 77 tons and was built from plate and steel castings by arc welding.

Fig. 2—The three main gears of this 1000-hp. drive weigh 14,500 lb. each and the flywheel weighs 25,800 lb.



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Japanese Steel Equipment Fabricated by Arc Welding

By A. F. DAVIS
Vice-President, Lincoln Electric Co.

JAPANESE steel engineers, in order to be sure that their steel mill equipment will be the most modern in the world, came to America recently for mill drives fabricated by arc welding.

Arc welding enabled the builder, the United Engineering & Foundry Co., Youngstown, Ohio, to build these drives in a quarter of the usual time, also to reduce the weight of base and cover 30 per cent and save the cost of expensive patterns. This type of construction permits inclosing the

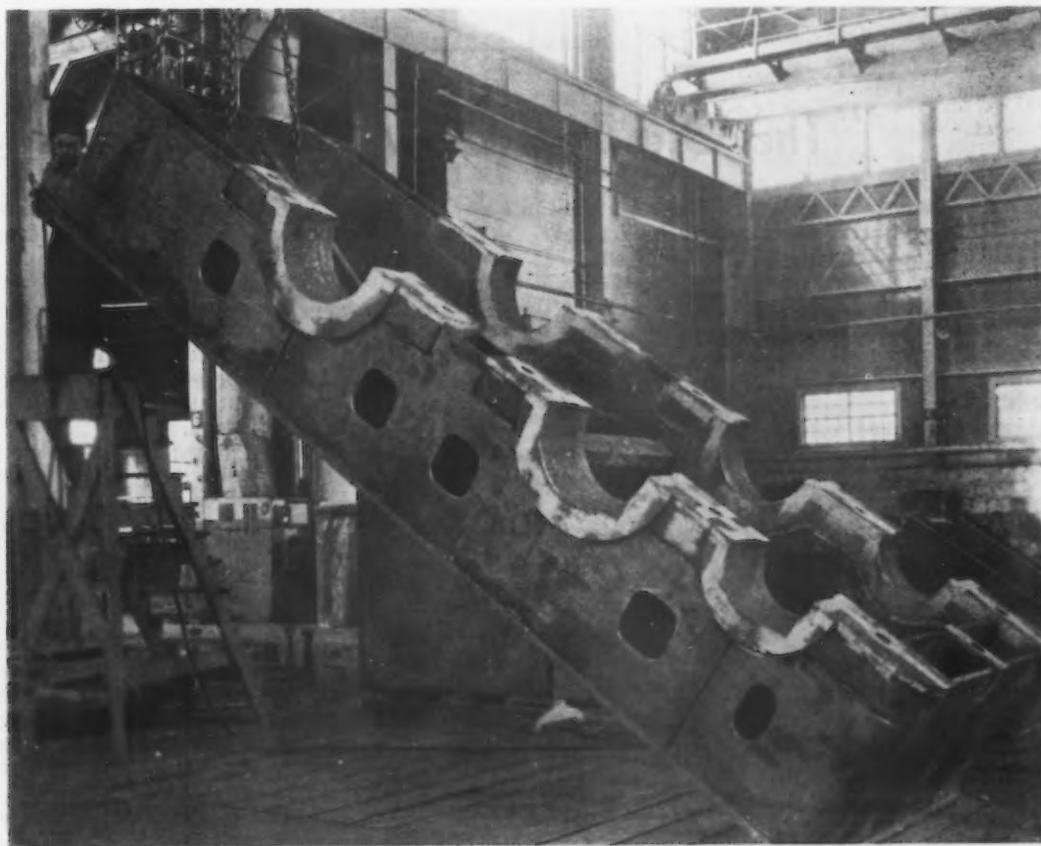
whole mechanism so that force feed and splash lubrication can be used, thus increasing the life of the equipment. In older units, employing cast steel construction, no cover was used over the drive.

The one thousand horsepower sheet mill drive, shown in Figs. 1 and 2, is 36 ft. 9 in. long, and 9 ft. maximum width, with a total weight of 77 tons. The structure alone contains 38,300 lb. of rolled steel and 33,000 lb. of cast steel. One inch plate was used in the bed and $\frac{3}{8}$ in. in the cover.

In building the drive the cast steel bearings were set up on floor plates and positioned to the proper dimensions. Plates of proper length and sizes were tack welded sufficiently to maintain dimensions. The cast steel bearings which extend from the gear shaft to the foundation were joined together by plates welded to the casting.

Each gear of this drive weighs 14,500 lb. and is 10 ft. 4 in. in diameter. The flywheel is a rolled steel disk 10 ft. in diameter and 7 in. thick.

Fig. 4 — The gear case for the 1500-hp. steel mill drive. Looks like a casting but is arc welded from plates and steel castings.



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A SPECIAL W. F. & John Barnes machine has been installed to bore and counterbore the transmission pilot hole and to face the center bearing of the cylinder block. This machine embodies a patented hydraulic system consisting of two pumps, one a geared type for imparting rapid traverse movements and the other a small radial plunger type for the feed movements. The pumps are controlled by a common hydraulic valve which is operated by dogs to change from rapid traverse movements to feed movements. The pump circuits are completely separated.

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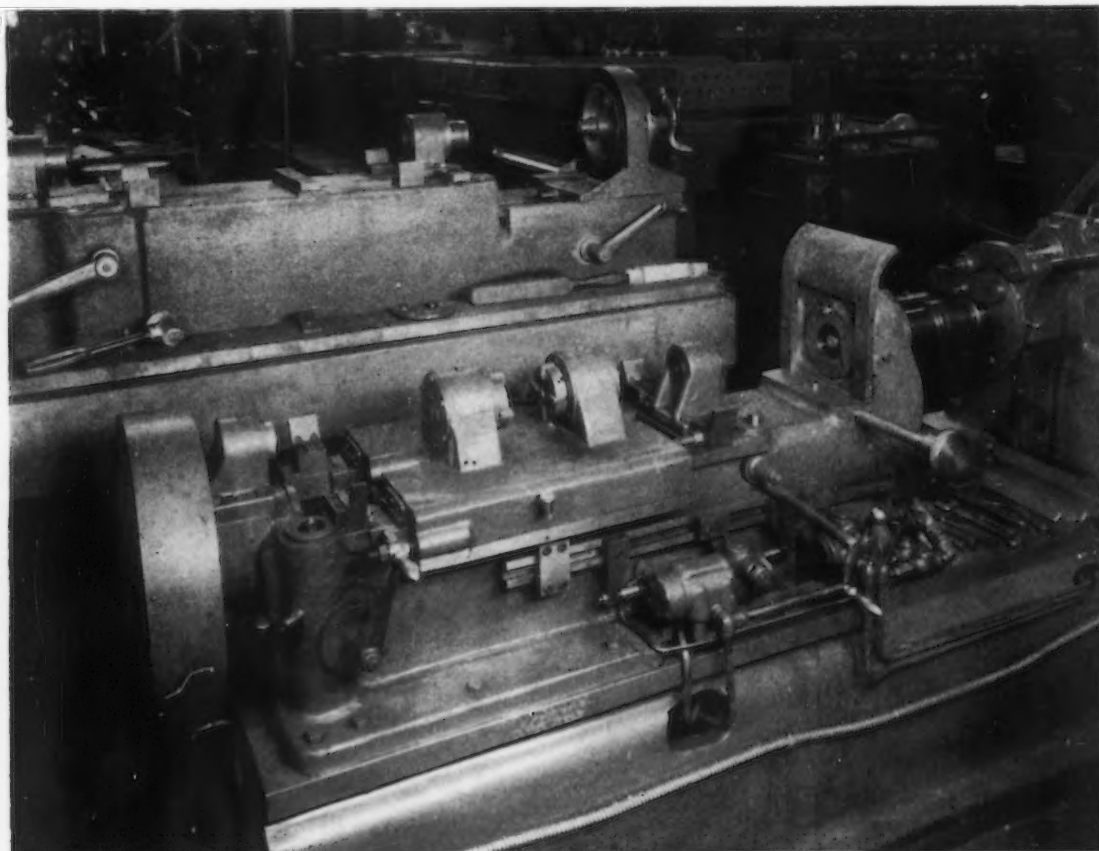
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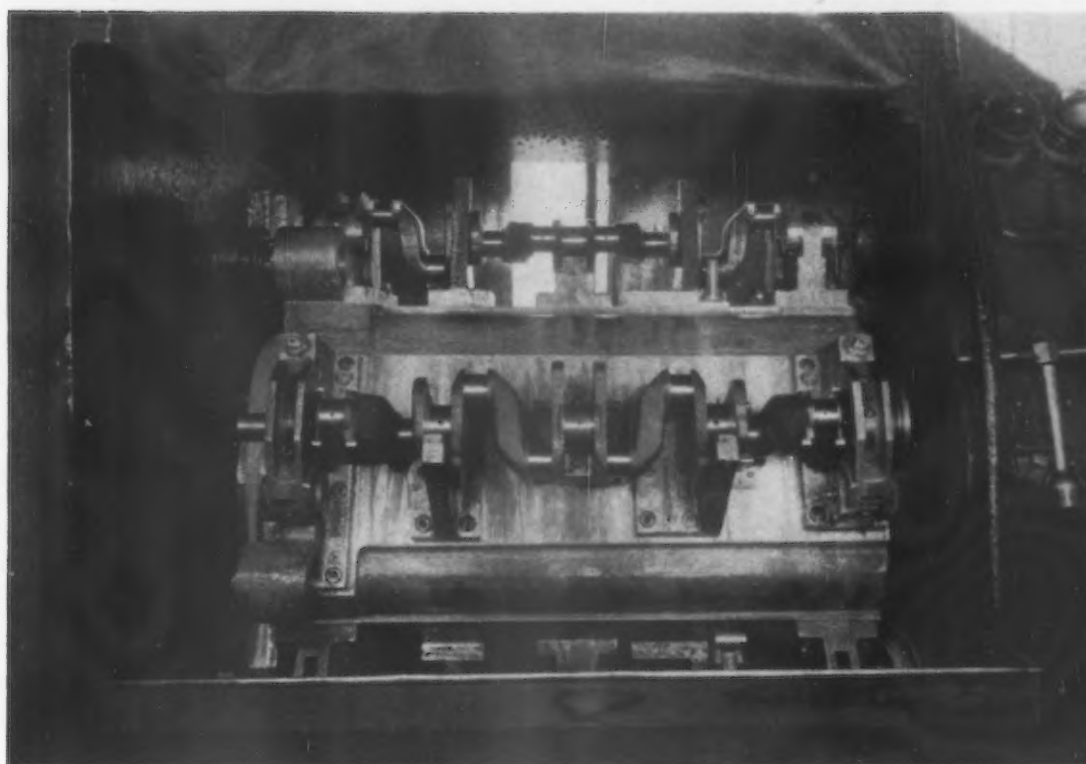
receives oil for its operation from the same source as the square ram type unit used for boring and counter-boring. In the facing cycle, the milling cutters feed to a positive stop in one direction for facing one side of the bearing, dwell and automatically rapid-traverse in the opposite direction. They then strip to a slow feed and face the second bearing surface against a positive stop, dwell and automatically return to the loading position. The hydraulic pressure imposed upon the facing carriage is so accurately controlled and both dwells are so closely regulated that the bearing is machined within the specified tolerance.

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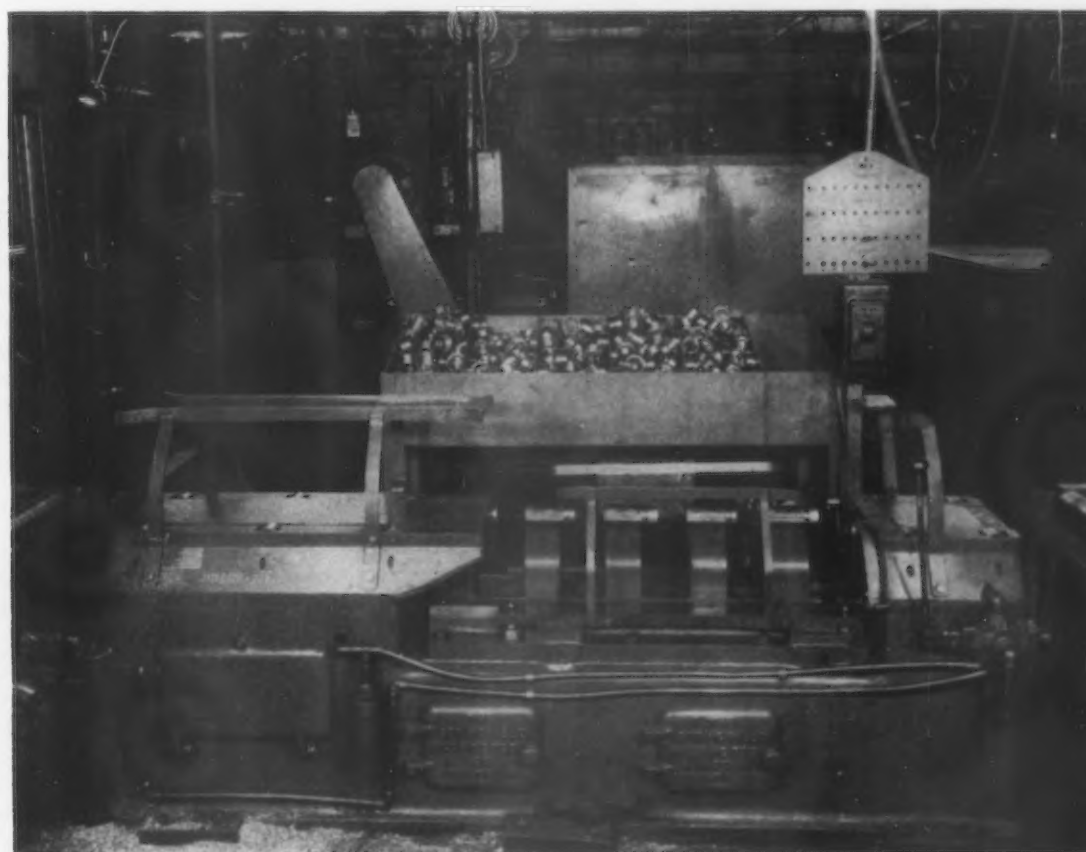
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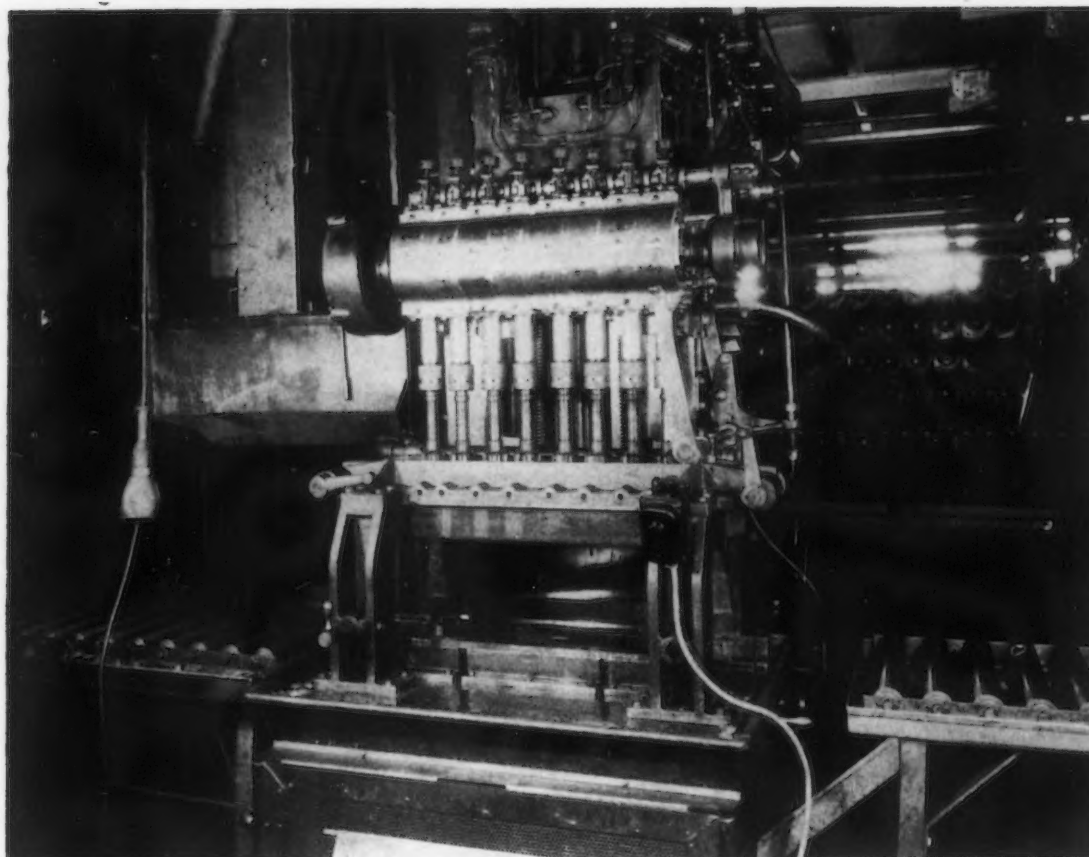
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Assembling Camshaft Bearings

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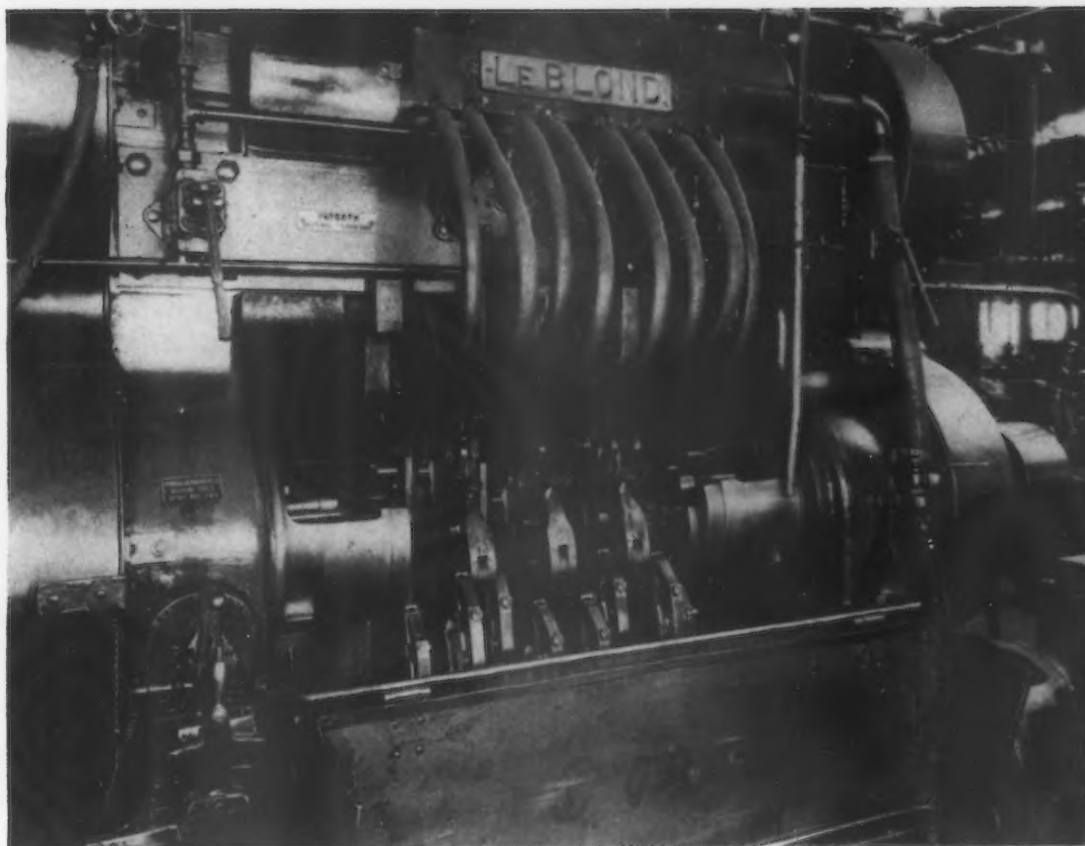
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The material presented is arranged in readily usable, quickly comprehensible form. The various kinds of motors, generators and combinations are treated in separate sections, each of which is practically complete in itself, and which makes it possible to find in one place most of the standards pertaining to a given kind of rotating apparatus.

A few of the major sections of the book are: Universal Motors, Small

D. C. Motors, Small A. C. Motors, Large D. C. Motors, Large Induction Motors, Large Synchronous Motors, A. C. Elevator Motors, A. C. Crane Motors, D. C. Generators, Synchronous Generators, Motor-generator Sets and Synchronous Motor-generator Sets.

Sections added to the 1934 edition of "NEMA Motor and Generator Standards" include:

Director-current Generators (General Purpose Sizes), Buffer and Grinder Motors, Motor-generator Sets (150 Kw. and Smaller), Motion-picture Motor-generator Sets.

The general sections of the new book and the section on definitions which defines over 150 terms used in dealing with motors and generators have been considerably amplified.

In response to requests received from many varied industries, the standardized mounting dimensions for motors have been included in the new publication. This makes it possible to obtain readily the standard mount-

ing dimensions for various ratings of large power d. c. motors, large power a. c. motors (single-phase and poly-phase), elevator motors and crane motors. Rules are given for determining frame numbers, and letters are provided for convenience in indicating the various mounting dimensions. Many motor manufacturers have been supplying motors in accordance with these standard mounting dimensions for some time, but this is the first time that this information has appeared in print.

The new book should prove useful to the consulting engineer, the machine designer, and the purchaser, since it sets forth in convenient form that which is adopted as standard for the industry.

The new "NEMA Motor and Generator Standards" contains 176 pages in strong flexible linen binding, size 8 x 10½ in. It may be purchased for \$2.00 per copy from the National Electrical Manufacturers Association, 155 East Forty-fourth Street, New York.

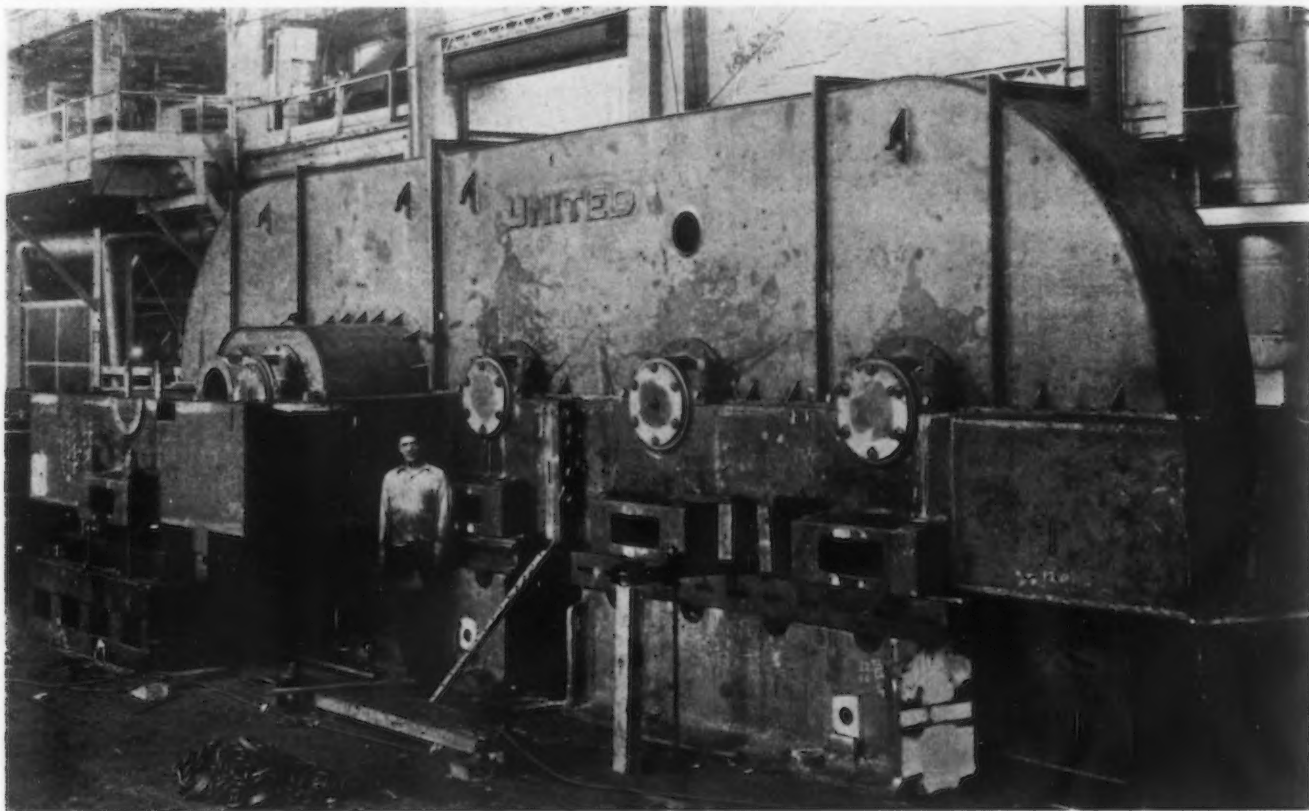
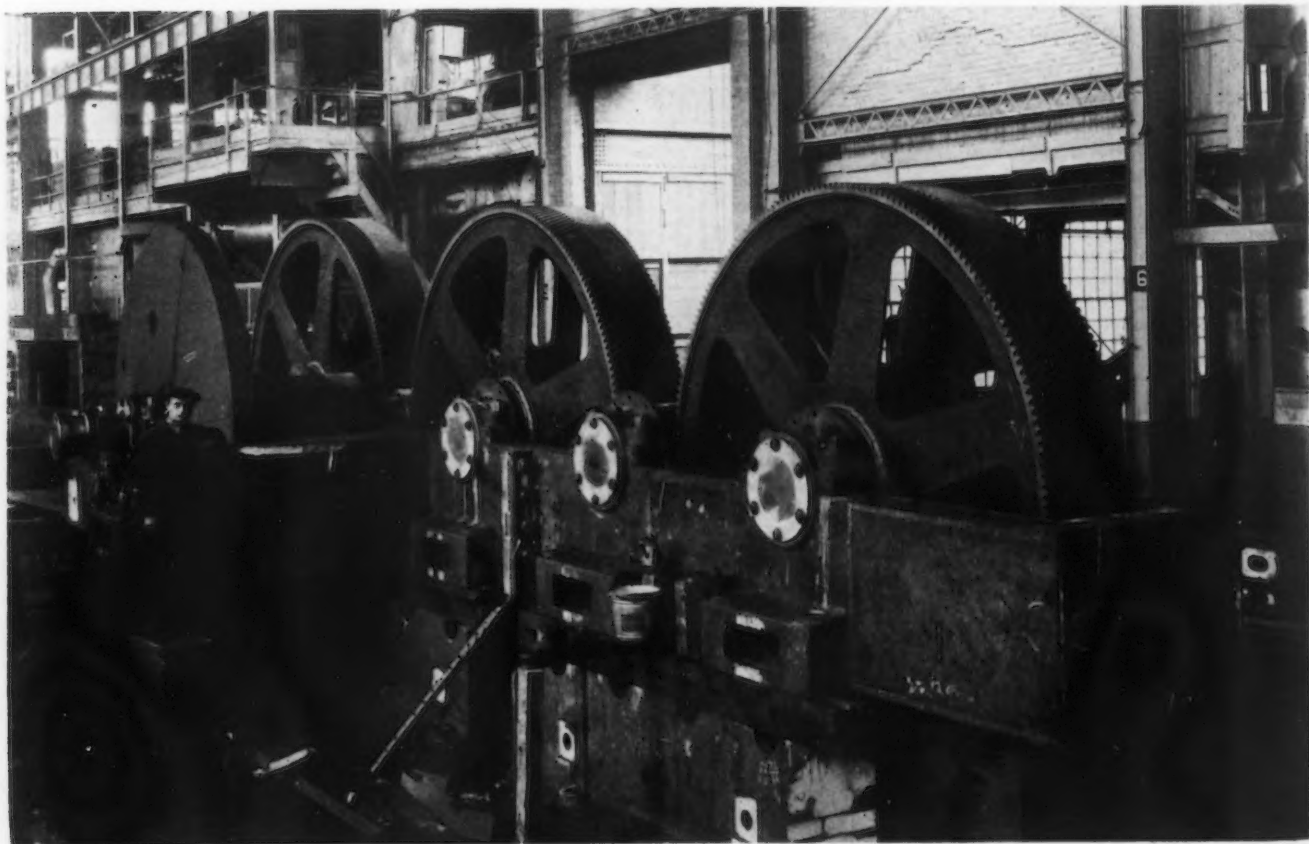


Fig. 1—This 1000-hp. mill drive weighs 77 tons and was built from plate and steel castings by arc welding



Fig. 2—The three main gears of this 1000-hp. drive weigh 14,500 lb. each and the flywheel weighs 25,800 lb.



Japanese Steel Equipment Fabricated by Arc Welding

By A. F. DAVIS

Vice-President, Lincoln Electric Co.

JAPANESE steel engineers, in order to be sure that their steel mill equipment will be the most modern in the world, came to America recently for mill drives fabricated by arc welding.

Arc welding enabled the builder, the United Engineering & Foundry Co., Youngstown, Ohio, to build these drives in a quarter of the usual time, also to reduce the weight of base and cover 30 per cent and save the cost of expensive patterns. This type of construction permits inclosing the

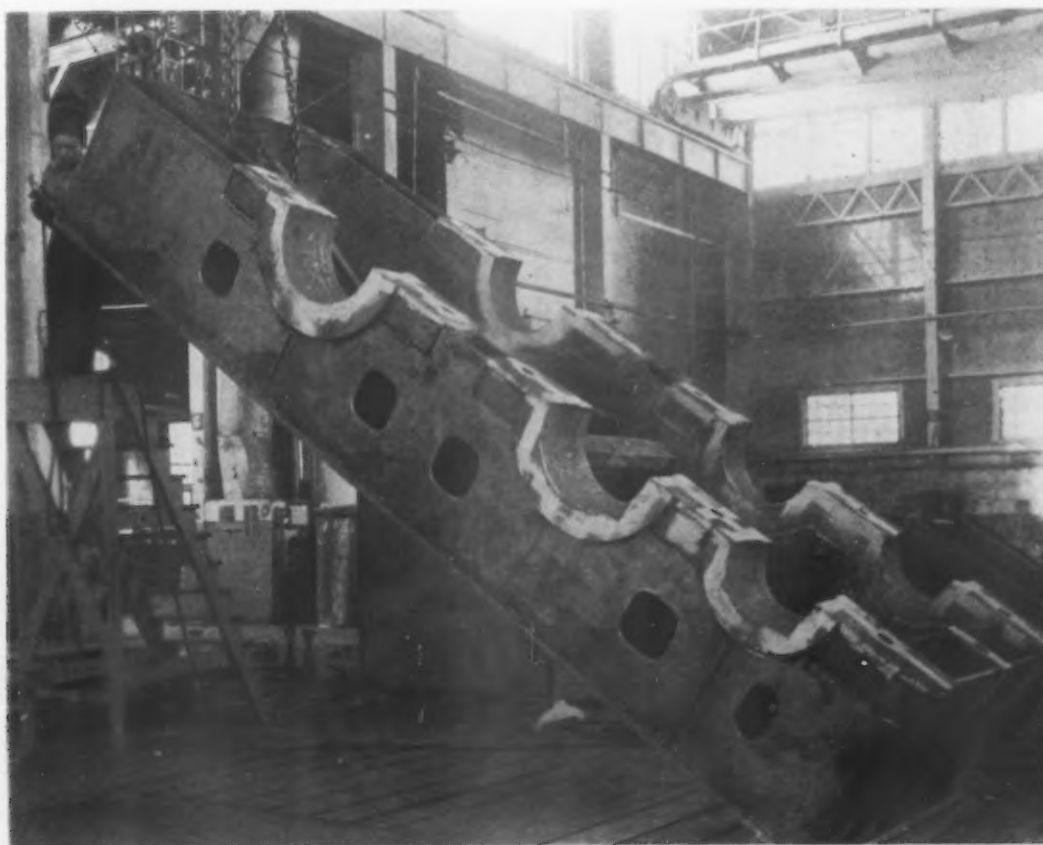
whole mechanism so that force feed and splash lubrication can be used, thus increasing the life of the equipment. In older units, employing cast steel construction, no cover was used over the drive.

The one thousand horsepower sheet mill drive, shown in Figs. 1 and 2, is 36 ft. 9 in. long, and 9 ft. maximum width, with a total weight of 77 tons. The structure alone contains 38,300 lb. of rolled steel and 33,000 lb. of cast steel. One inch plate was used in the bed and $\frac{3}{8}$ in. in the cover.

In building the drive the cast steel bearings were set up on floor plates and positioned to the proper dimensions. Plates of proper length and sizes were tack welded sufficiently to maintain dimensions. The cast steel bearings which extend from the gear shaft to the foundation were joined together by plates welded to the casting.

Each gear of this drive weighs 14,500 lb. and is 10 ft. 4 in. in diameter. The flywheel is a rolled steel disk 10 ft. in diameter and 7 in. thick.

Fig. 4 — The gear case for the 1500-hp. steel mill drive. Looks like a casting but is arc welded from plates and steel castings.



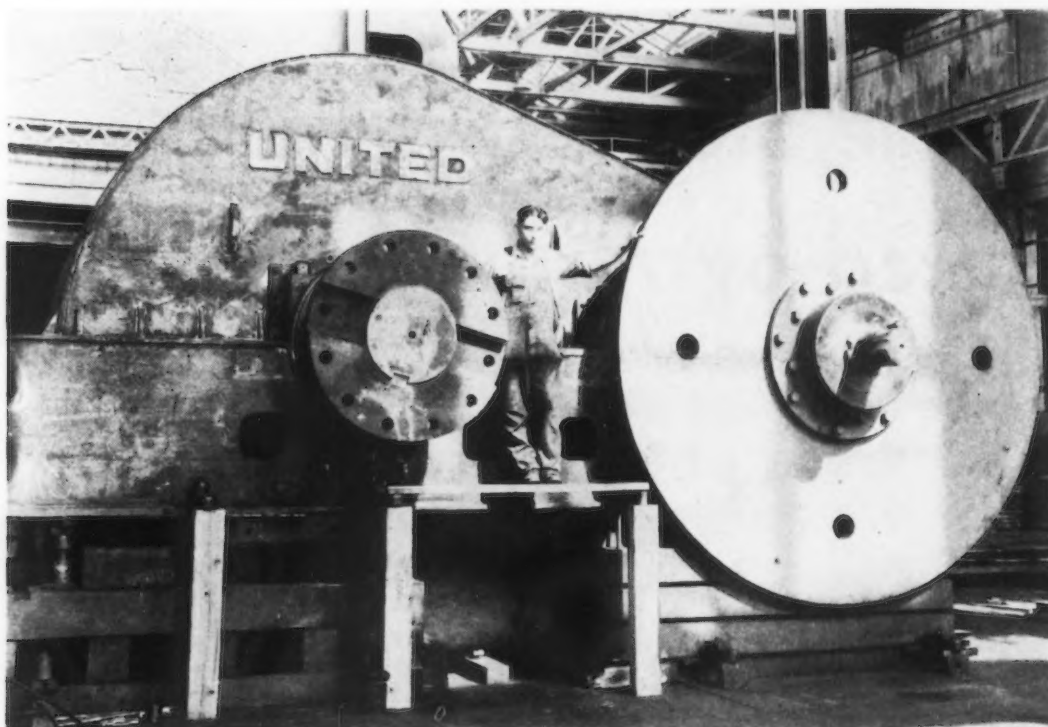


Fig. 3—Also fabricated by arc welding is this 1500-hp. mill drive. It is for Japan and will drive a hot sheet mill.

It weighs 25,800 lb. The whole drive mechanism, consisting of gears, shafting and flywheel, weighs over 41 tons.

Another arc welded mill drive recently completed by this company for use in Japan, is the 1500 hp. unit shown in Fig. 3 for operating a hot sheet mill. Fig. 4 shows the arc welded gear case for this drive.

The bed of this drive is of welded steel construction using 1-in. plates. Roller bearings are supported in cast steel bearing shells designed to extend sideways to accommodate the bolts of the foundation. This drive has two flywheels 10 ft. in diameter by $3\frac{1}{2}$ in. thick, both together weighing 25,000 lb.

By using arc welding, the builders

of this drive were able to make delivery in four weeks, whereas, with cast construction three months would be required. Additional savings were made in the cost of expensive patterns and weight.

Welding equipment used on these jobs was supplied by the Lincoln Electric Co., Cleveland.

"The Old Deal Did Achieve Something"

THE following summary from a recent editorial in *Forbes Magazine* also gives something to think about:

"The Old Deal had its faults, admittedly. It did not prove able to save America from the economic tragedy which overtook the world as an aftermath of the World War destruction. Yet, America did achieve something under the now-despised Old Deal. For example:

America became the richest country on the face of the earth.

America attained world leadership in industry.

America paid higher wages than ever before known.

American standards of living became the admiration and envy of other peoples.

America's savings deposits eclipsed even those of France.

American colleges and universities attracted unprecedented numbers of students from all grades of homes.

Americans enjoyed more travel, more recreation, more amusements than any other nationals.

American home-owners greatly outnumbered those in any other land.

American families were protected by insurance on a scale not even approached in any other part of the world.

American workers and American employers enjoyed friendly relations unmatched in any other industrial country.

American industrial management attained heights which evoked both the applause and despair of employers elsewhere.

America developed machinery and mechanization eclipsing anything and everything in other progressive nations.

America rose to leadership in invention.

America built up the greatest transportation system on the face of the globe.

America initiated and won preeminence in aviation and aircraft building.

America brought into being electric power facilities on a scale dwarfing those of any other continent.

America led the world in telephony.

America led the world in motion pictures.

America led the world in radio.

America is leading the world in television.

America promises to outdistance all other peoples in air conditioning.

America, under the Old Deal, afforded greater scope than any other country for earning wealth.

America set an example to other peoples of all other countries in large-scale generosity and philanthropy.

In their enthusiasm, New Dealers should not entirely forget these Old Deal facts. The New Deal has not proved exactly faultless.

'Hold fast to that which is good'."

The Associated Magazine.

Hydraulic Feed Grinder Offers Portable Coolant System

A NEW hydraulic feed surface grinder offering a portable, self-contained coolant system is now being built by Gallmeyer & Livingston, Grand Rapids, Mich. It is illustrated on page 37.

The working surface of table is 6 in. x 18 in. and the automatic longitudinal and transverse movements are sufficient to enable the operator to cover the entire working surface of table with $\frac{1}{2}$ -in. wide wheel which is standard equipment.

The machine is built around a one-piece column and base casting, assuring a permanence of alignment between the cross saddle ways and the upright head ways.

The hydraulic mechanism is mounted inside of the base of the machine and driven by a 1 hp., 1200 r.p.m. speed motor.

Practically any desired longitudinal table speed up to a maximum of over 50 ft. per min. is instantly obtainable on this machine. Speed is controlled by lever conveniently located on the front of the saddle and may be varied at the will of the operator.

The machine is available with automatic cross feed or with hand cross feed, whichever lends itself best to

customers' particular requirements. A 7-in. diameter grinding wheel is standard equipment with this construction.

An alternative type of spindle drive consists of a 1 hp., dynamically balanced motor mounted on an adjustable bracket attached to the spindle housing with a tex-rope drive to the grinding wheel spindle.

An extra interchangeable motor sheave and extra tex-ropes can be furnished, so that after customer has accumulated a number of worn wheels they can change the motor sheave and increase the spindle speed so as to be able to obtain maximum efficiency from the worn wheels.

The machine is obtainable with self-contained motor-driven, dust arrester system, and also with the portable self-contained, motor-driven coolant system illustrated. The portable feature provides maximum convenience in cleaning the tank. When doing this the cover is simply lifted off complete with the small $\frac{1}{4}$ -hp. motor and pump mechanism. The tank is then quickly detached from the machine and moved to a suitable location for dumping, flushing and refilling.

provided in the design. Lubrication is automatic and a dual filtering system and automatic coolant flow is secured. One motor drives both machine and pump.

In announcing this machine, the builder stresses the attainment of "complete synchronization of the rotary with the reciprocating motion." This is claimed to be essential to the attainment of the greatest degree of accuracy. The machine is illustrated on page 36.

Adjustable Blade Milling Cutter

A NEW design of serrated blade milling cutter designated as its "Rigid Back" series has been brought out by the Cowles Tool Co., Cleveland. Following the principle that a cutting tool should be rigidly supported by a true surface, a true flat surface is provided on the back face of the serrated blade and on its mating face on the cutter body. The double taper wedge is provided with serrations permitting the adjustment of the blade to change the diameter of the cutter.

The blade and wedge when assembled to the cutter body form a rigid dovetail tooth, capable, it is claimed, of resisting all strains to which the cutter may be subjected. The blade is adjusted by driving the wedge out and resetting the blade to the proper diameter. A minimum amount of labor and equipment, it is pointed out, is required to adjust the blades prior to resharpening.

The cutter body and wedges are made of heat treated alloy steel. The blades are of high speed steel although tungsten carbide or other cemented carbide tipped blades will be supplied if the customer desires. The method of holding the blades is claimed to be well adapted to the use of special cutting tools.

The cutter is made in a standard range of 51 sizes and 8 different types of cutters and only 21 replacement blades are required to cover the entire range. Shell end cutters are made in 8 sizes from 3 in. to 7 in. diameter, staggered tooth side mills in 8 sizes from 4 in. to 8 in. in diameter and cone type face mills in regular types carrying blades $\frac{3}{8}$ in. thick and heavy duty types with blades $\frac{1}{2}$ in. thick.

Industrial Furnaces. Surface Combustion Corp., Toledo, Ohio. Four folders containing numerous illustrations and descriptive matter of furnace installed in steel plants for normalizing, pack heating, bloom heating, soaking pits and other operations, controlled atmosphere continuous furnaces for bright annealing strips, sheets, bars, and other products, operating data on burner installations and a discussion of shop practice in gas carburizing.

Vertical Speed Reducers In Compact Design

THREE types of vertical speed reducers of compact design have been added by Falk Corp., Milwaukee, to the company's line of horizontal "Motoreducers."

One of these, known as type IX, is an integral unit, corresponding to the Falk No. 1 type horizontal Motoreducer. It embodies a round frame motor, one end bell being removed for close coupling to the gear case. Double and triple reductions are available giving respective ratio ranges of 9.7 to 41.9 in the double and from 45 to 288 in the triple reduction. Eight sizes are made with driven shaft diameters ranging from 1 $\frac{1}{2}$ in. to 3 $\frac{1}{2}$ in. This type of Motoreducer is illustrated on page 37.

Also illustrated on the same page is type ZX, available in similar speed ratios and range of sizes. This type is somewhat less compact, since it utilizes any standard horizontal ball-bearing type motor with feet, no motor changes being necessary.

Not illustrated is type LX, which is for single reductions only ranging from 1.5 to 9. This type utilizes a

round frame motor. It is made in 11 sizes with driven shaft diameters ranging from 1 $\frac{1}{2}$ in. to 2 $\frac{1}{2}$ in.

The horsepower range of these reducers is from $\frac{3}{4}$ to 75. Motor speed of 1750 is considered standard but others may be used. Special pressure lubrication and oil sealing are provided.

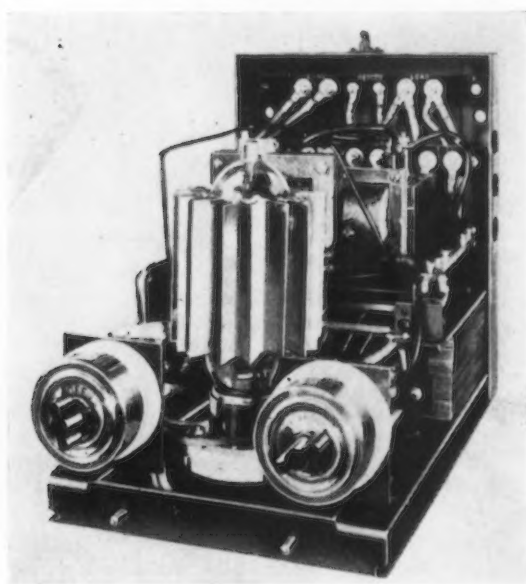
Flexibility Featured In New Honing Machine

A NEW honing machine, known as "Series 300" has been developed by Hutto Engineering Co., Inc., Detroit. It is made for single spindle or multiple spindle operation and for both high production and general utility use. For the latter, two, four, six or eight speed changes can be supplied for both reciprocating and rotary motion.

The machine is of unit built construction with all geared drive, gears being made of heat-treated alloy steel. Both motions are controlled by multiple disk clutches of the wet plate type. The length of stroke is positively controlled and coincidental mechanical lift-out control of hone is



FOR dressing rubber belts, the B. F. Goodrich Co., Akron, Ohio, has developed a solution claimed to increase grip and horsepower for long periods without damaging the belt body. It is the result of a series of tests in which 10-ply rubber belting samples were immersed in various liquids for a period of 28 days at room temperature.



KATHETRON manual regulator has been developed by Roller-Smith Co., New York, for use where voltage manipulation of alternating currents is required. In another form, the regulator will function as a booster or reducer over a range of 50 per cent either way. Our picture shows cover removed.



SHOCKLESS reciprocation, and complete synchronization of rotary and reciprocating motions are claimed for this honing machine, which is one of a new line being introduced by the Hutto Engineering Co., Inc., Detroit. Single and multiple-spindle types are available. Text description will be found on page 35.

AT LEFT

ONLY 21 replacement blades are required to cover the entire range of 51 sizes in this new "Rigid Back" milling cutter, a new product of the Cowles Tool Co., Cleveland. For further description, see page 35.



VERTICAL Motoreducers in three types are now made by Falk Corp., Milwaukee. Below is shown type IX, in which the motor is integral with the reducing mechanism. Above is pictured the type ZX, designed to use any standard horizontal ball-bearing motor. Both types are made with double and triple reductions. Descriptive data are given on page 35.

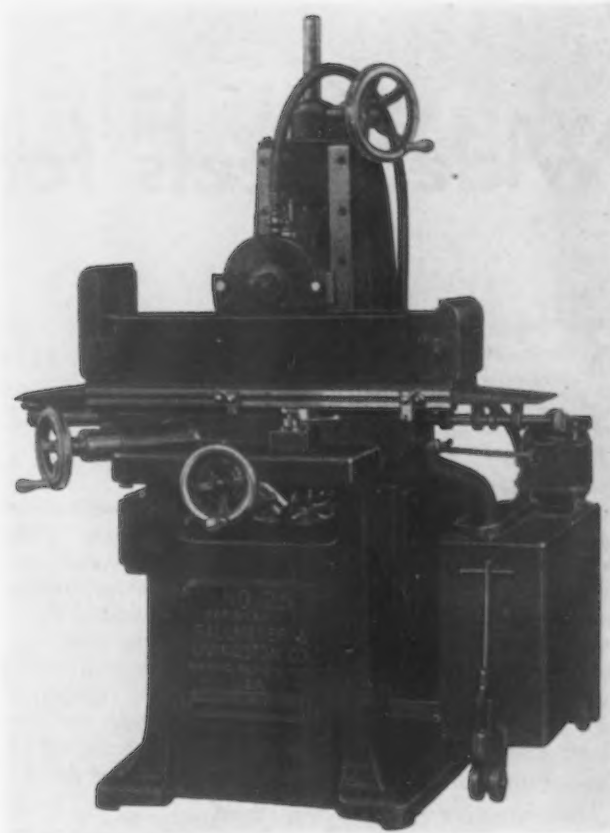


AT RIGHT

A SELF-CONTAINED variable-speed device known as the "U.S. Varidrive Motor" is a new product of U. S. Electrical Mfg. Co., Los Angeles. It provides an infinite number of speed changes, within a wide range through the incorporation of a dual-disk variobelt. Motor is of the squirrel-cage type and speed changes are secured by turning the handwheel.

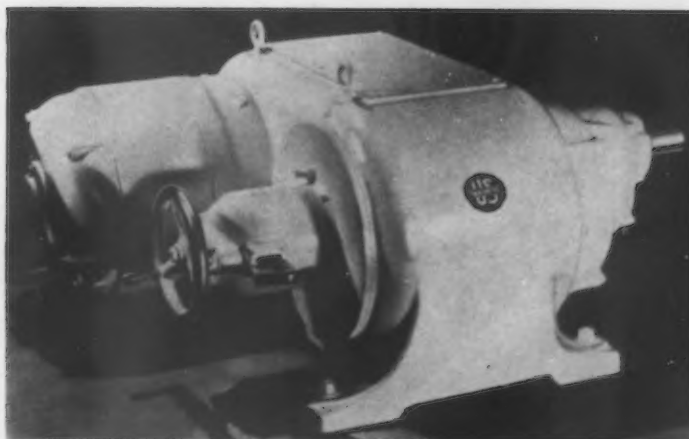
AT RIGHT

A SELF-CONTAINED portable coolant system is provided for the new Gallmeyer & Livingston hydraulic-feed surface grinder shown at the right. The hydraulic mechanism is contained within the base, and the base and column are made in one piece, to assure maximum rigidity. The machine is described in detail on page 35.



AT RIGHT

THE new line of portable electric drills being offered by Skilsaw, Inc., 3310 Elston Avenue, Chicago, comprises eight models, which are designed for the various conditions encountered in maintenance and production work. Sizes range from 1/4 in. to and 1/2 in. inclusive. Motors are provided for both alternating and direct current, and in standard and special voltages.



Wide Sheets for Streamline Bodies

RAPID development of the streamline automobile body has led to increasing demands for sheet steel in widths up to 78 in. or more. Steel rolling mills, in most instances, are not prepared to furnish such wide sheets and the extras charged on material of such size are necessarily rather high. A very large investment is required for the installation of mills to roll such material, and, even though the tendency in sheet mill construction is toward increasing width, the automobile body industry, because of the width extras charged, has sought to make itself less dependent upon the mills in securing the required sheets.

Different methods have been tried to achieve this end. Last year the writer had the opportunity to observe such experimental work in a European body plant where two normal-sized 20-gage sheets were welded together by means of gas welding. The results obtained in this experiment were negative, because it was shown that the metal reached a change of structure through the welding, regardless of how clean the seams were

By **PETER W. FASSLER**
Consulting Welding Engineer, Detroit

ground and finished for the press operation. The sheets could not stand deep drawing and cracked close to the weld. Similar experiments with arc welding were found not to improve this condition. Both methods produced a weld that was too hard and lost the necessary ductile qualities. Even the annealing after the weld was not able to bring back the original qualities in full.

In the United States, experiments in this direction were made with resistance welding; first with roller seams, but this proved unsatisfactory because neither hammering of the seam nor cold-rolling produced an acceptable seam, a thin hair line always appearing. Flash welding was considered, but from a sceptical angle because the removal of the flash was a problem and also because a crystallization of the seam was looked for in

the beginning, although this fear proved somewhat exaggerated and was overcome with relative ease.

Soft and Clean Weld Necessary

In flash welding such sheets we discovered that the normal flash welding, as used in body work, was not entirely satisfactory. The goal was to reach an absolutely soft and clean weld. This was accomplished through a slow weld; also, the upsetting (or as it is often called, the finish of the weld) had to be different from the usual flash welding.

It was also found that straight-trimmed sheets had the tendency to make butt welds, more so than with the body welding where uneven trimming was almost natural. This uneven trimming permitted the welding machine to develop the arc slowly because the current in the beginning of the weld was only approximately one-third of the transformer capacity.

An entirely different condition occurred in welding these straight-trimmed sheets where the transformer had to give the full load immediately.

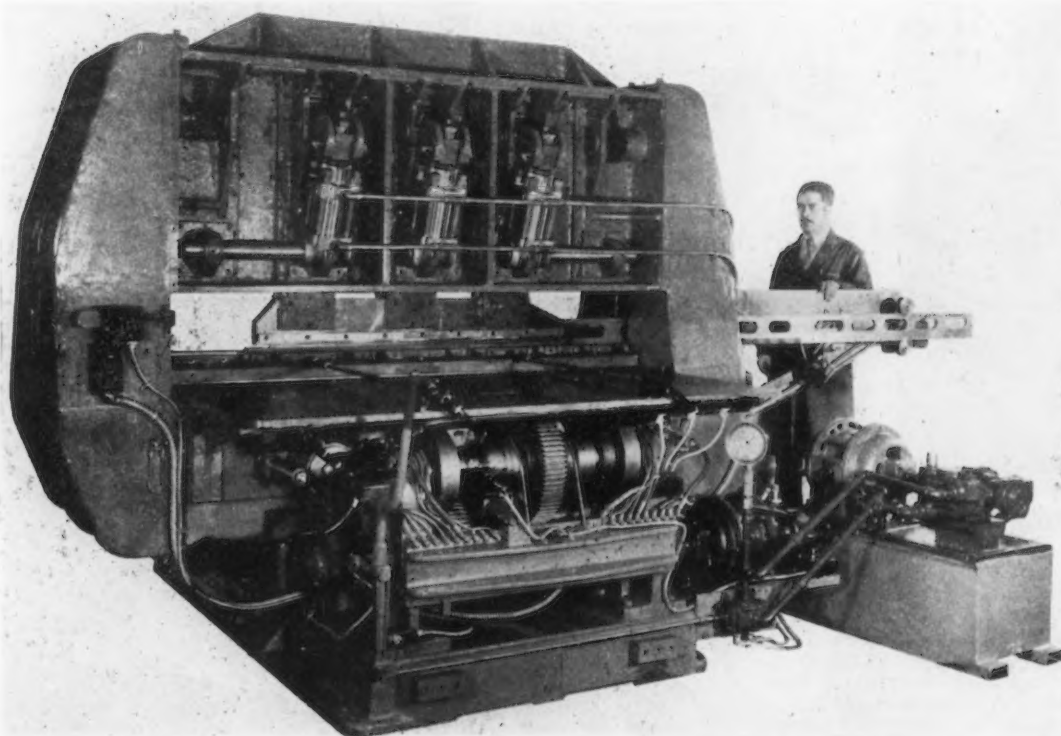


Fig. 1—Flash welding machine designed to weld sheets 90-in. wide. Transformer capacity is 300 kw. Clamping pressure is applied hydraulically and upsetting is operated through motor drive. Elkonite electrodes are employed.

Produced by Special Flash Welder

Thus it was found necessary to govern the slide motion in a manner different from that of the conventional flash-welder. The movement in approaching the electrodes had to be extremely slow in the beginning in order to allow the flash to develop along the full length of the seam. The slide was then allowed gradually to pick up speed; therefore the tendency for butt welding, which was experienced with the conventional movement, was eliminated. The design was also different from the conventional body welder in the relation between upsetting point and opening of the pilot switch. In this manner a soft and ductile weld was accomplished which could be easily finished to a perfectly smooth seam.

Electrodes Carefully Studied

A machine which works on this principle has to be of sturdier design than the normal flash welding machine. The clamp pressure per square inch had to be increased to 900 or 1000 lb. In making such welds, proper alignment is of greatest importance; therefore, the electrodes and their materials have to be studied very carefully. Elkonite was selected for this application. This copper-tungsten alloy, which has already played an important role in the welding industry, is able to withstand this high clamping pressure without deformation or wear, as it has a hardness of over 200 Brinell and a relatively high conductivity.

Fig. 1 shows a flash welding machine for such an application, the capacity being for sheets 90 in. wide. The clamping pressure is accom-

plished by hydraulic means, and the upsetting is operated through motor drive. The transformer has a capacity of 300 kw. The complete machine weighs approximately 15 tons.

Welds Flash Trimmed and Ground

After a clean and soft weld was accomplished, the problem of finishing on a production basis arose. To make the welded material equal to a one-piece sheet, the flash has to be removed on both sides and a perfectly smooth surface must be obtained. The Morton flash trimmer shown in Fig. 2 solved the trimming problem. This machine is electrically operated,

including clamping and reversing. The flash on both sides is removed simultaneously, leaving very little material for grinding, which is the next operation. After the grinding, which is done automatically on a conveyor, the weld is absolutely clean. A sample weld after test is shown in Fig. 3.

Information has reached us that in Europe some steel mills have put such a machine in production, and it is claimed that this method of producing extra wide sheets is much more economical than to install new rolling equipment. The cost of welding and finishing a 90-in. sheet is only 14 cents; this, of course, does not include depreciation or overhead.

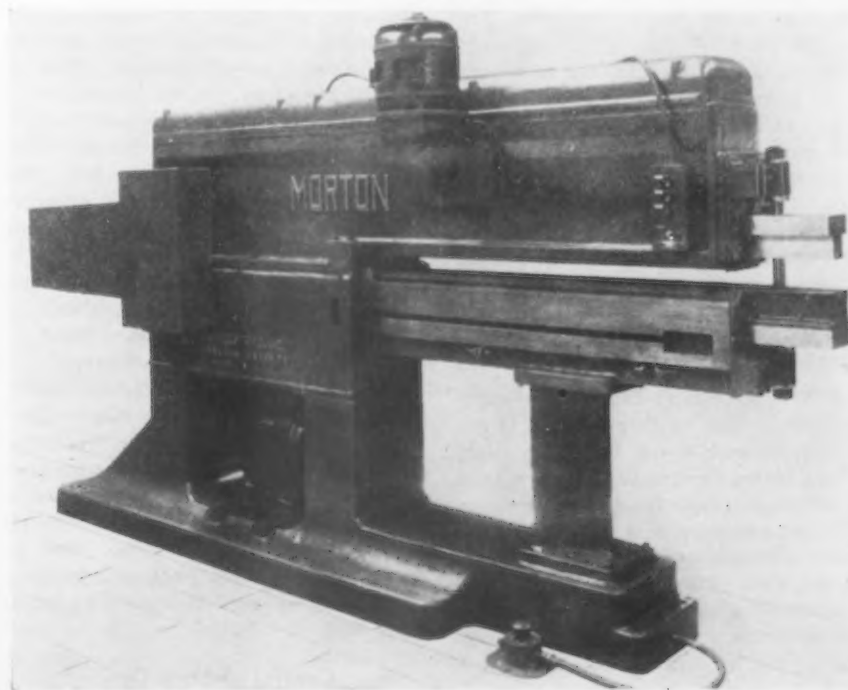


Fig. 2—After welding, the flash is removed from both sides of the sheet simultaneously by this draw-cut flash trimming machine, the operation leaving little material for grinding. Grinding is done automatically on a conveyor.

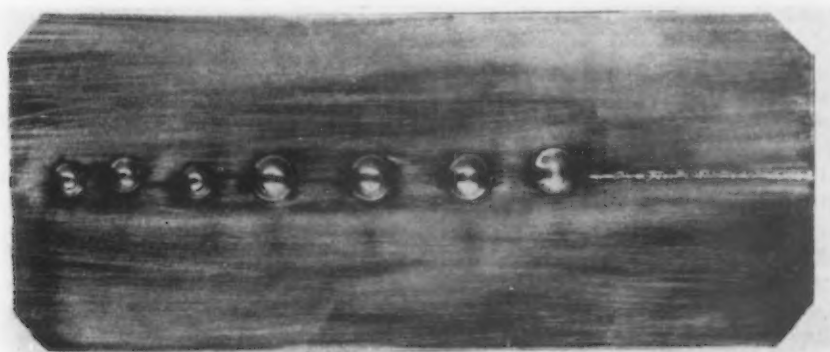


Fig. 3—Sample of welded sheet as it appears after testing.

Raw Materials and Their Relation to

SOME years ago the Fafnir Bearing Co. undertook to establish definitely to just what extent bearing life was influenced by the quality—i.e., cleanliness—of the steel used in manufacturing. To this end, with the cooperation of the research department, a very extensive program of breakdown tests was instituted, covering several of the popular sizes of bearings. Rings and balls were made from both clean and unclean steel; heat-treated according to standard practice, and tested to destruction under heavy overloads. The results were amazing. Bearings made from steel that was known to be unclean gave very inconsistent life, with many failures after only a relatively few hours. Bearings made from steel that was known to be comparatively clean (and all steel cleanliness is comparative) showed tremendous increase in life, with much more consistency of results. Here, as in all products subject to fatigue stresses, the old saw about the chain being as strong as its weakest link holds good.

What happens to cause these early failures in ball or rings? Steel is not a homogeneous mass, made up solely of the elements desired, but in reality is heterogeneous, due to segregations of these elements, and contains multitudes of non-metallics, or in plain words, dirt. This dirt may be distributed throughout the mass as large particles, or it may be very finely divided; its amount in the aggregate may be large or small, but every pound of steel contains dirt, and what most interests us is its amount and distribution.

Inclusions

Let us take as an example a ball made by the cold-heading process. The steel from this ball is reduced by rolling and drawing from an 8-in. ingot down to, say, 0.400-in. round. Let us assume that a dirt particle (slag, for instance) has become trapped in the ingot, and during the subsequent reductions has been reduced in diameter and increased in

length in direct relation to the reductions of the steel. In the finished ball wire, we may have this inclusion extending through several balls. These balls, after cold-heading, contain this inclusion, which comes out at the surface in two places. The balls, in service, are subjected to two surface deformations during each revolution of the ball, and due to the fact that they do not revolve in a constant plane, the areas containing the inclusion are sure to take the load and consequent deformations at times. Inclusions are either very hard or very soft and consequently cannot give the sound metal proper support. This results, therefore, in the formation of minute cracks which gradually deepen and enlarge to a point where particles of the ball flake off or spall. And once spalling has started it enlarges rapidly, with failure of the bearing occurring very shortly.

Should the large inclusion have been subdivided into a multitude of very small particles, their effect on the metal would have been greatly reduced and the consequent bearing life greatly increased. Thus our problem is to obtain steel as free from dirt as possible, and at the same time keep down the size of the dirt particles to a minimum. Heat treatment will not increase or decrease the size or amount of the dirt particles; in other words, *steel quality is determined at the mill.*

Control of Steel Quality

Now, a few words as to how we control the quality of the bearing steel. First, it is advisable to examine the steel for cleanliness before much labor has been spent on it; hence all such tests are made on the billets, which constitute the rolling mill's raw material. Hardened longitudinal micro specimens are prepared from the top, middle and bottom of each heat of steel, which are examined very carefully under the microscope. An excess of non-metallics, and especially if of appreciable length, constitutes basis for rejection. In addition

to the micro specimens, a disk is sawed from the top, middle and bottom of each ingot as represented in billet form. These are acid-etched to develop the structural characteristics and then examined under binoculars. Rejections found by this examination are pipe, excessive segregation, or hammer bursts. As a further check on the mill's rolling and inspection, samples are sent to us by the mill from the bottom end of each bar rolled from bottom billets, and from both ends of every coil of ball wire. The binocular inspection on these samples is mostly to take care of surface defects.

It may be well to mention here that our specifications for ball steel are more rigid than for ring steel. The steel must be as nearly clean as it is possible to make it, and the size and allowable seam depth are very closely watched. Ball steel must also be free from decarburization, in order to prevent unsatisfactory hardening, since only a small amount of stock is removed in finishing. The reason for more rigid specifications for ball steel is that the balls in a bearing get harder service and more punishment than the rings, and therefore are required to be of superior quality to offset this handicap.

Although it is true that, fundamentally, bearing quality is determined at the mill by the cleanliness of the raw material, yet without proper control over the various heat-treating operations which are necessary before the bearing is completed, even the best of steel may be easily ruined.

Control of Forging Temperature

First, the forging temperatures must be controlled so as to produce perfect forgings. Too much heat will burn the steel and too little will cause underfills or break the machines. The normalizing temperatures and times must be regulated to suit the size of ring being treated. The annealing of the hard forgings must be carried out under exact metallurgical control

to Bearing Life

By FAYETTE LEISTER

Director of Engineering,
Fafnir Bearing Co.

to satisfy the requirements of the machining department. Too much or too little of either temperature or time results in forgings with poor machinability and consequent increase in production costs. Finally, the hardening and drawing (or tempering) heat treatments are applied to the rings and balls and here, even more than with the other treatments, must the temperatures, times, weights, etc., be rigidly adhered to. All heat treatments are under strict metallurgical control, and in order to obtain results our furnaces are all equipped with automatic temperature controls, resulting in accurate and uniform heating at all times.

The hardness of rings and balls is, obviously, one of great importance, and the attainment and preservation of the correct hardness calls for means of determination that leave nothing to chance. The oldest method for determining the hardness of treated steel is the file test, and this method is still widely used. Since file testing is influenced so largely by the human element, however, standards are hard to establish, and other means of testing, free from such influences, must be used. The instrument most widely used for such work is the Rockwell Hardness Tester, although another more recent development in the hardness testing field is the magnetic tester, and both are used extensively. All rings and balls are very thoroughly tested for hardness, both by the heat treating and the inspection departments before being allowed to pass along to the grinding machines, all three testing devices being used at times.

Bearing Steel Requirements

In the analysis of bearing steel carbon is the chief hardening element, but alone does not fulfill the requirements of a bearing steel. Chromium, on the other hand, of itself does not impart hardenability to iron, as does carbon, but when combined with carbon to form double carbides the result is increased hardness, toughness and

QUALITY requirements for materials entering into modern ball bearings are unusually severe due both to the close limits of manufacture and the exacting service expected of the finished product.

Mr. Leister, in this article, tells of the precautions that are exercised in material control for the product coming under his supervision. The methods outlined will be found applicable to other steel products requiring a similar degree of care in their production.

depth of hardness, even when oil-quenched.

Bearing steel must be capable of attaining high hardness to resist wear; must be tough to withstand distortion and fatigue under heavy loads, and must be capable of hardening throughout its section when quenched in oil; this latter to prevent distortion in hardening. Also, it must be readily available, at moderate cost. Modern bearing steel possesses all of the above requirements and when carefully controlled as to quality at the mill, fabrication and heat treatment, the resulting product is as nearly perfect metallurgically as it is possible to obtain.

Cleanliness is obtained mainly through mill inspection of the steel in billet form, and although the cost of such inspection adds considerably to the cost of manufacture, the advantages gained are of too great value to be discarded, and indirectly the extra cost is made up many times in fewer rejections during manufacture, and better service to users.

To sum up briefly, steel for quality ball bearings must be *clean* to insure long life; it must be capable of attaining great *hardness* to resist wear; it must be *tough* to resist shock and heavy loads; it must be *non-deforming* in hardening to prevent excessive

distortion; and lastly, it must be *readily obtainable* at reasonable cost. The steel used in ball bearings today fulfills all of these requirements.

Corrosion Tests of Mild Steel Sheets

OUTDOOR corrosion tests made on thin sheets were reported in *Korrosion und Metall* for July by F. Eisenkolb. Eight exposure stations were organized, one in a wooded valley and the others near ironworks, rolling-mills, chemical works, a pickling shop, the settling pond of an iron vitriol recovery plant, an ore preparation plant, and a foundry.

Nine steels were used, the carbon contents ranging from 0.03 to 0.07, the manganese from 0.05 to 0.49, the phosphorus from 0.008 to 0.034, the sulphur from 0.003 to 0.068, and the copper from 0.07 to 0.64 per cent. Silicon was present only in traces, and one steel contained 0.08 per cent of molybdenum.

After finish-rolling, all sheets were annealed to produce a uniform structure; one-third of each batch of steel was then left with the mill scale attached, one-third was pickled before the final anneal, and one-third was galvanized; in one case, sheets were pickled, annealed and then cold-rolled 5 per cent. The specimens measured 500 x 700 mm. and were 1 mm. thick. They were supported on wooden frames at an angle of 10 deg. to the horizontal, the fixing screws being insulated by washers of vulcanite.

The duration of the test extended to 38 months. The results of visual observations and loss-of-weight tests show superiority for copper-bearing steel; the useful effect of the copper is increased by the presence of a very small amount of molybdenum. Very clean steels behaved badly. Corrosion near iron and steel works was no greater than that in the wooded valley. The results of the tests on the cold-rolled sheets indicate that structural work which is continually under stress, or which is built of cold-worked steel that had not been subsequently annealed, will corrode more rapidly than otherwise.

New Things in Materials and Processes

By EDWIN F. CONE

German Low-Alloy, High-Strength Steels

AMERICAN metallurgists and engineers are not the only ones interested in low-alloy, high-strength steels. According to H. Kappenberg in *Die Zeitschrift des Vereines deutscher Ingenieure*, there are five leading German steels of this character of the following general composition:

	Si	Mn	Cu	Cr	Mo
No. 1.....	0.8-1.1	0.75-0.90	0.25-0.4
No. 2.....	0.5-0.7	0.9-1.1	0.5-0.6
No. 3.....	0.3-0.5	1.2-1.6	0.3-0.6
No. 4.....	0.3-0.5	0.7-1.0	0.6-1.0	0.4-0.6
No. 5.....	0.5 max.	1.0-1.3	0.35 min.	0.15-0.25

The carbon in these steels averages 0.12 to 0.15 per cent. The range for tensile strength in the as-rolled condition is 75,000 to 90,000 lb. per sq. in., with the yield point 75 to 80 per cent of the ultimate.

These are all copper-bearing steels with the manganese relatively high and the silicon moderately high. No. 1 is the standard "No. 52" steel, resembling Freund steel with copper present. No. 2 is known as "Lauchhammer Structural." No. 3 is a Krupp steel which is medium-manganese steel containing copper, similar to Man-ten, recently announced in this country. Steel No. 4 is called "Union Steel," which is a chromium-copper steel. The last, No. 5, is named "G.H.H." and is a copper-molybdenum steel high in manganese, or perhaps it may be styled a medium-manganese steel containing copper and molybdenum.

Contrast these steels with the 10 or a dozen American steels and one

realizes the possible combinations of elements and the bewilderment of the prospective user.

Stainless Steel Watch Cases

HERE is a rather new use for stainless steel—wrist watches. An American firm, which manufactures one of the leading makes of reliable

timepieces, has recently introduced in the market wrist watches for men or women made of stainless steel. The case and the wristbands are of this alloy. They are claimed to be non-tarnishable and as serviceable as gold or other alloys usually used. Another advantage which is pointed to is that a first-class movement can be sold at a more reasonable price.

New Facts About Permanent Magnet Steels

A NEW permanent magnet steel of German origin is being talked about but not much information is available regarding its properties or composition. It is fairly well established that it is a nickel-aluminum composition, about 30 per cent aluminum and 12 per cent nickel. It is said to compare most favorably with some of the present-day cobalt and other permanent magnet steels.

For some time one of the large steel companies has been producing a special permanent magnet steel containing 38 per cent cobalt. The usual product has been regular bar shapes in the conventional sizes. Recently success has been attained in rolling certain irregular-shaped bars for a special application. This achievement is rather new and is difficult to attain.

The same company has developed a technique for producing castings of this permanent magnet steel, the demand for which has increased rapidly.

Achievements in Powder Metallurgy

INTERESTING progress in powder metallurgy has recently been achieved. Large bearings of bronze for railroad locomotives are being produced by mixing the powdered metals in the proper proportions, impounding them into a mold under great pressure and then heat-treating the resulting form or product. The result is a uniformly solid alloy bearing, substantially accurate as to size, so that no machining is necessary. This process avoids the cleaning required with castings, and the removing of gates and heads and finish machining. Also, it is reported that bearings made of powder metals have a much longer life than those that are cast. An automobile company is successfully producing brass or bronze parts in the manner described.

The powdered metals can be pressed into a mold so that the resulting product is, after heat treating, a solid rod. Wire rolled or drawn from this bar is demonstrated to have a considerably higher tensile strength than wire drawn from a rod rolled from melted metals.

A product has been made from these powdered metals which has a high degree of resistance to heat. It is an alloy of 18 per cent chromium, 8 per cent nickel and 3.5 per cent molybdenum with the remainder iron. Practically no carbon is present.

The fact that there are nearly 25 metals obtainable in the form of powder emphasizes the possibilities of powder metallurgy in the light of the foregoing facts.

Beryllium-Silver Alloy Does Not Tarnish

A NON-TARNISHING silver is being investigated in England. The National Physical Laboratory has concluded some researches on the effects of small additions of beryllium to standard silver. These alloys have been demonstrated to possess a very high tarnish resistance to sulphur compounds. They form the subject of British patent No. 399,261 of 1933.



Latest Sea Disaster Points to Increased Use of Steel in Ships

THE Morro Castle disaster of Sept. 8, in which more than 100 lost their lives, has brought the day of the all-steel, or at least all-metal, passenger ship nearer. Most prominent and influential among those demanding a ban on the use of wood and other inflammable material in passenger ships is President Roosevelt. At a press conference in Hyde Park last week he expressed the view that the next Congress would make a definite effort to eliminate wood construction in passenger vessels of all kinds, whether they operate on the ocean or on rivers and lakes.

While conceding that it might be necessary to sacrifice some of the extreme luxury of modern liners, he questioned whether it would not be

possible to build comfortable and attractive passenger vessels of fireproof materials throughout. Such ships, in his opinion, could be made light by the use of newly developed alloys, and even tapestries and furnishings could be made of fireproof materials. He suggested that deep, soft upholstery for furniture could be made of asbestos wool. He recalled that he had been comfortable on recent voyages on Navy vessels in which all appointments are subordinated to the necessity of reducing fire hazards.

The all-fireproof ship that the President recommends is, and has been the goal of the shipbuilding industry, but its full attainment is beset with complications. The Morro Castle itself, a ship only a few years old, was

all-steel except for the interior finish in the superstructure and minor partitions. The exterior of the housings above deck was constructed of $\frac{1}{4}$ -in. steel plates.

The use of steel for partitions and doors, especially for staterooms, has been given especial study, but thus far no generally satisfactory type of construction has been developed. Wood has a deadening quality which steel lacks and passengers demand protection from sounds emanating from neighboring cabins. A double wall of steel sheets separated by insulation has been proposed for partitions, but such construction immediately introduces the problem of cleanliness, which is all important on a vessel. No material can be used

EDWARD G. BUDD, president of the Edward G. Budd Mfg. Co. of Philadelphia and a pioneer in the construction of all-steel automobile bodies and trains, long ago advocated light-weight steel partitions in ships. In commenting on President Roosevelt's recommendation to the effect that American passenger ships of the future should be of all-steel construction, he said:

"I have long advocated steel partitions for boats, having built a sample all-steel cabin in 1907. It was a duplicate of one of the better staterooms in the then new steamer Lusitania. Since then

our engineers have developed in succession the all-steel automobile body and the stainless steel railway train, the latest of which is the famous Burlington 'Zephyr.'

"There is no doubt but that, under the pressure of immediate need for economy, in too many instances the partitions, paneling, doors, etc., of ships have been built of inflammable material. However, it is practicable and eventually economical to construct them of light-weight stainless steel timber. Partitions made of this material are strong, light, economical and firesafe. The cost of their maintenance is much less

than that for combustible materials. Their use should have the effect of reducing marine fire insurance rates materially. So, in the end, fireproof construction would not only be humane in shipbuilding, but would result in actual savings to ship owners.

"I firmly believe that not only the ships of the future, but many of those now in use will be converted to all steel and thus afford greater safety. This will be another of the many advances in the arts which will for years to come keep all the American people busy serving their neighbors and earning a living for themselves."

which would provide a harboring place for rats, mice or germs. Recent experimentation suggests that glass wool may prove a satisfactory insulation for steel cellular construction, since it is non-organic, non-inflammable and apparently shatter-proof.

While light, corrosion-resistant metals have been suggested for this type of cellular construction, their use appears to be barred because of their cost. In the Navy, where stainless steel is being widely used in interiors, cost is less important than the necessity of keeping weight within treaty limitations. In passenger vessels, ship builders state, resistance to corrosion would not be a serious consideration except where the steel is exposed to the weather and there a relatively low alloy steel sheet might be used in place of the more expensive alloys. Such low alloy steels, however, have not yet been thoroughly tested for sea service.

The cost of interior metal construction cannot be materially reduced by the adoption of mass production methods, it is claimed. The possibility of making multiple steel pressings for doors and partitions is limited to the section of the vessel amidships, since the problems of camber and shear in the design of a vessel's superstructure result in a progressive change in dimensions as the ends of the boat are approached.

There are also limitations so far as the use of fireproof tapestries and up-

holstery is concerned. Asbestos wool, after being subjected to ship vibration for a time, flattens out and loses its softness. Besides, the real arbiters of the furnishings are the passengers. Will they be willing to sacrifice comforts and luxuries for greater safety? They cannot be forced to accept such a sacrifice by national legislation, because competition on the high seas is international. Such legislation, instead of achieving its end, might have the effect of driving more American passengers to foreign vessels.

Besides the problem of partitions, doors and furnishings, there is the question of deck coverings. To date wood is the only material that has proved its ability to provide necessary insulation and at the same time to withstand the extreme variations in heat and cold and the exposure to rain and salt air which are experienced at sea. Even Navy vessels still have wooden deck coverings.

If, however, the President's proposal should finally prove practicable, the additional steel or metal required in ocean liners would total 300 or 400 tons, it is estimated. Besides, there would be a larger market for metal furniture, cabinets, shelving, lockers, etc. Replacement of wood with metals, it is claimed, will not necessarily increase the weight of ships. In fact, a saving in weight may be effected, depending of course on the type of construction developed and the materials employed.

Two Small Steckel Cold Mills Ordered

THE Cold Metal Process Co., Youngstown, Ohio, has received contract from the Crucible Steel Co. of America for a 7½-in. Steckel mill, which will be installed at Crucible's Jersey City, N. J., plant. The mill, which is a new type with removable rolls and outside gear drive, will be used for rolling high carbon and stainless steels. The Cold Metal company has also received contract for another 7½-in. Steckel mill from the Signode Steel Strapping Co., Chicago, which will use the mill for rolling low carbon steel box strapping.

Applying of Plate and Shape Extras Postponed

NEW quantity extras on plates and shapes are to be applied Dec. 1 on sales for shipments beginning Jan. 1, 1935, instead of on sales for shipment on and after Oct. 1. Decision to postpone the effective date was made at a meeting in New York, Sept. 13, of the steel code authority. The change was made to provide interested parties with an opportunity to present their views. It is reported that the chief complaint against the new extras came from small fabricators.



FEW parts of an automobile engine require so high a degree of accuracy in manufacture as does the camshaft. Each cam must be not only perfect in contour, but perfectly positioned in relation to the other cams, in order that the twelve valves shall be uniform in their opening and closing and in their timing. In the Chevrolet motor plant, camshafts are produced on a series of highly developed automatic machines, remarkable for their accuracy. Then every shaft is subjected to a minute inspection before it can be placed in an engine. The illustration shows inspectors checking the shafts with the aid of dial micrometers, sensitive to one ten-thousandth of an inch.



NEWS OF THIS WEEK

British Iron and Steel Demand Is Improving

LONDON, ENGLAND, Sept. 18 (*By Cable*).—British pig iron consumption is increasing and deliveries to Scotland are the heaviest of this year. Forward buying has been resumed and the lighting of additional furnaces is now in prospect. Minimum quotations of East Coast hematite have been advanced one shilling per ton owing to the increased cost of ore and fuel, but makers are well booked with advance orders.

Continental competition in semi-finished steel is proving to be ineffective and English works are busy. The demand for finished steel is improving. South Africa has ordered 4000 tons of rails and substantial business is being done with China and the Far East. Russia is said to be negotiating a further supply of pipe.

Exports of pig iron from the United Kingdom for August were 11,675 tons, of which 150 tons were shipped to the United States. Total exports of iron and steel aggregated 193,412 tons.

The tin plate market is still unsettled owing to agreement conditions and home trade is quiet in this commodity but export demand is growing, especially from Australia. Orders in hand total about 4,000,000 boxes and output is being maintained at above 70 per cent of capacity.

The Continental iron and steel market is fairly satisfactory except for sheets which are improving. Bars are in demand. Good business is being had from China, Japan and India. Because Japan is unable to fulfill delivery on a Mexican pipe contract for 25,000 tons, the business is now being shared by German and French firms.

The threatened strike of Belgian coal miners has been averted by Government intervention.

ered by A.S.T.M. specifications 149 and 150, 2 in. thick and under carry an extra of 90c. for flange quality and 95c. for fire box quality. The latter quality for fusion welding has a \$1.20 extra which includes a 50c. extra for plates 2 in. to 4 in. thick.

No standard extras have been used for these products since the specifications were adopted a year or two ago, as mills did not have data on which to compute costs. However, some of the producers have been quoting extras at 40c., 45c. and 95c. respectively, for the three grades.

Non-Ferrous Foundry Papers of Interest

PRACTICAL papers will feature the non-ferrous sessions at the fifth International Foundry Congress and thirty-eighth annual convention of the American Foundrymen's Association, to be held in the Convention Hall, Philadelphia, Oct. 22 to 26. Besides the general interest sessions, such as those on refractories, sand control, materials handling, and apprentice training, there are to be two technical meetings on non-ferrous castings, and a round table luncheon for discussion of problems.

Three papers will be given at the general session on non-ferrous castings. The ever-present difficulty of porosity in castings will be discussed in detail by A. W. Lorenz, Bucyrus-Erie Co., Milwaukee, in his paper on "Porosity in Leaded Bronze Bushings." Mr. Lorenz will give the results of his experience with this defect, and his method of approaching the problem. He constructed a mold in which he could watch the metal currents, and thus was able to change the gating in such a way as to overcome the porosity.

R. R. Kennedy, metallurgist, material division, War Department, Wright Field, Dayton, Ohio, will have a paper on the "Effect of Elevated Temperatures on the Strength and Dimensional Stability of Certain Alu-

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9	
Billets, open-hrth.	£5 10s.	to £5 15s.
Tin plate, per base box	18s.	2d.
Steel bars, open-hearth	£7 17½s.	
Beams, open-hrth.	£7 7½s.	
Channels, open-hearth	£7 12½s.	
Angles, open-hearth	£7 7½s.	
Black sheets, No. 24 gage	£9 5s.	
Galvanized sheets, No. 24 gage	£11 5s.	

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas ..	£2 7s.	
Wire rods, No. 5 B.W.G.	£4 10s.	
Steel bars, merchant	£3 5s.	
Sheet bars	£2 8s.	
Plates, ¼ in. and up	£4	
Plates, 3/16 in. and 5 mm.	£4 2s. 6d.	
Sheets, ¼ in.	£4 7s. 6d.	
Beams, Thomas ..	£3 2s. 6d.	
Angles (Basic) ..	£3 2s. 6d.	
Hoops and strip base	£4 2s. 6d.	
Wire, plain, No. 8 ..	£5 7s. 6d.	
Wire nails	£5 15s.	
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.	

New Extras on High Tensile Steel Plates

NEW extras for high tensile strength plates for very high pressure work and for electrically welded pressure vessels making an advance up to \$10 a ton become effective Oct. 1, being included in the new lists of extras issued by the American Iron and Steel Institute. Plates cov-

minum Alloys Used in Aircraft." He has made a very intensive study of the effects of different temperatures, different lengths of time, on the various properties of aluminum alloys. His results indicate fields of application for certain alloys, based on the influence of heat on the physical properties.

"Melting Non-ferrous Alloys in a Cupola-Type Furnace" is the subject of a paper by W. C. Alvin, Imperial Brass Mfg. Co., Chicago. He will speak as a user, and will tell the story of his work with this type of melting equipment. He takes up the alloys best suited to the cupola, the advantages and disadvantages of this equipment, the refractories found most efficient, and gives a clear picture of one company's experience with cupola melting of red brass.

The second technical session is a symposium on the deoxidation and degasification of non-ferrous casting alloys. This subject, one of the most important to the industry, has been determined upon as one to be discussed annually until some definite conclusion is reached. This meeting is the second annual session on this topic.

Recognized authorities will discuss the deoxidation of different kinds of non-ferrous casting alloys, advancing opinions as to the theory involved, and giving the results of their use of methods and materials for this purpose. The introduction, and "Discussion of General Principles," will be given by Dr. C. H. Lorig, Battelle Memorial Institute, Columbus, Ohio. A report on the deoxidation and degasification of bronze foundry alloys will be made by O. W. Ellis, director of metallurgical research, the Ontario Research Foundation, Toronto, Ont., as chairman of a committee studying that subject. L. A. Ward, metallurgist, Chase Brass & Copper Co., Waterbury, Conn., will discuss "Yellow Brass Castings Alloys." "Aluminum and Its Alloys" will be taken up by H. J. Rowe, Aluminum Company of America, Cleveland.

Structural Steel Institute to Meet

THE twelfth annual convention of the American Institute of Steel Construction, Inc., will be held at the Edgewater Beach Hotel, Chicago, Oct. 24 to 26. The meeting is an important one and all members of the industry, whether they are members of the institute or not, are being urged to attend.

A complete report on the code situation will be made and a program that will contain discussions of other matters of benefit has been arranged. V. G. Iden, 200 Madison Avenue, New York, is secretary.

PERSONALS

H. A. HOUSTON has been appointed assistant to the general manager of the United Engineering & Foundry Co., Pittsburgh. He joined the company in October, 1933. He was born in Springfield, Mo., and was formally educated at Purdue University and the University of Illinois. He has had a broad engineering experience, particularly in the railway engineering field. During the World War he was major of engineers, military railways, and served 18 months as aid to Samuel L. Felton, director general. Mr. Houston was at one time manager of mechanical parts, railway equipment engineering department, of the old Westinghouse Electric & Machine Co., and also works manager of the R. D. Nuttall plant.

MAX RACHWALSKY, associated with E. H. Jones Machine Tools, Ltd., London, England, arrived in New York Sept. 12, and expects to establish connections for the sale of American machine tools in Great Britain.

CHARLES A. LIDDLE, president of the Pullman Car Mfg. Corp., has been elected to the board of directors of the American National Bank & Trust Co., Chicago.

G. V. WOODY, formerly associated with National Transit Pump & Machine Co., New York, has been appointed district sales manager for Allis-Chalmers Mfg. Co., Park Building, Pittsburgh.

H. W. RINEARSON, formerly vice-president in charge of sales for A. M. Byers Co., has been appointed president of the Shaw-Perkins Mfg. Co., with headquarters in the Oliver Building, Pittsburgh. Prior to his connection with the Byers company, he had been general manager of the Armco Culvert Manufacturers Association at Middletown, Ohio.

A. M. DOUGLAS, Chicago district manager, Maynard Electric Steel Casting Co., Milwaukee, will leave Dec. 11 for Sydney, Australia, on business. He is prepared to attend to business matters for concerns with customers in Australia, and arrangements may be made through O. H. SCHILDKNECHT, sales manager of the Maynard company. As a former resident of Australia, Mr. Douglas is familiar with the country, more especially the western part.

H. S. MCPHERSON, who has been identified for the past 15 years with the United States Rubber Products, Inc., New York, part of that time in charge of mechanical sales in the Boston district, has been appointed

manager of mechanical sales in the St. Louis district. He is being succeeded at Boston by W. G. MUELLER, who has been associated with the company for more than 25 years.

N. N. FRITZ, identified with Ajax Tool Steel Sales, 114 Liberty Street, New York, has been appointed eastern United States representative for the Poldi Steel Works of Czechoslovakia. He was associated for eight years with the former Poldi Steel Corp., New York, and, in his new capacity, will handle similar products. The Tool Steel Service Co., 1627 West Austin Avenue, Chicago, has taken over the office and warehouse of the former Poldi company in the Middle West.

ARTHUR J. BRANDT has been named assistant general manager of the Hupp Motor Car Corp., Detroit. He is nationally known in engineering and manufacturing circles.

ALEXANDER C. BROWN has resigned as president of the Industrial Brownhoist Corp., Bay City, Mich., and has been elected first vice-president of the Cleveland-Cliffs Iron Co., Cleveland. On his graduation from Case School of Applied Science, Cleveland, Mr. Brown became connected with the Brown Hoisting Machinery Co., Cleveland, founded by his father, and became its president in 1918. When the company was merged with the Industrial Works, Bay City, Mich., he was elected president of the merged company. After this merger the Cleveland plant was removed to Bay City. In addition to other business connections Mr. Brown has long been prominent in civic activities in Cleveland. W. R. GEFFINE, secretary of the Cleveland-Cliffs Iron Co., has been elected a vice-president. He will retain his former duties as secretary.

MELVIN E. PATTISON has been elected president and treasurer, Industrial Brownhoist Corp., Bay City, Mich., succeeding ALEXANDER C. BROWN. He has been executive vice-president and secretary. Other promotional changes have been made in this corporation following Mr. Brown's resignation. E. S. CLARK, who has been a director, has been elected secretary. HOYT E. HAYES, export sales manager and in charge of sales in the Cleveland District, has been elected vice-president and sales manager. GEORGE A. LONG, who was plant manager, has been made vice-president in charge of manufacturing, and E. W. TAYLOR has been reelected vice-president in charge of engineering and purchases.



THIS WEEK IN WASHINGTON

Labor Renews Unionization Efforts

Majority Representation Decision in Houde Case Leads To Increased Activity in Steel Industry—Manufacturers Prepare For Showdown

WASHINGTON, Sept. 18.—Hailing as a sweeping victory the majority representation ruling by the National Labor Relations Board in the case of the Houde Engineering Corp., organized labor through the Amalgamated Association of Iron, Steel and Tin Workers is pressing hard for union recognition in the iron and steel industry. Already victorious in elections at the plants of the West Virginia Rail Co. and the Apollo Steel Co., supervised by the National Steel Labor Relations Board, the association is actively trying to consolidate its forces for pending drives in the largest units in the industry, the United States Steel Corp., the Republic Steel Corp. and the Bethlehem Steel Co.

In the South, the first move by the association since the Houde decision has been made at the plant of the Gulf States Steel Co., Alabama City, Ala. Last Friday hearings were held in connection with claims that workers at the plant had been discharged for union activity. More important from their point of view, members of the association charged denial of the right of collective bargaining.

Other Hearings in October

In the first week of October, a hearing will be held at Pittsburgh before the National Steel Labor Relations Board on the petition of Amalgamated workers at the McDonald, Ohio, plant of the Carnegie Steel Co., where last June an election gave a strong victory to the company union. The pending petition asks for a new election to de-

By L. W. MOFFETT
Resident Washington Editor, THE IRON AGE

termine collective bargaining representation, the association seeking to upset the prior election on the ground that the company union does not represent the workers within the meaning of Section 7-A of the Recovery Act. Especial importance is being given this petition by the association inasmuch as it concerns a large subsidiary of the largest unit in the steel industry.

Reports have it that the union has been unusually busy in organizing and that it believes it would register a victory if another election were held. In this connection the decisions of both the National Labor Relations Board and the National Steel Labor Relations Board are undoubtedly depended upon by organized labor to stimulate anew its campaign to muster additional members and it may be expected that the formidable drive already under way to gain control of labor in the iron and steel industry will be pushed to the limit.

Recognition is of course the end sought, though dealing with organized labor and recognizing it as such obviously are different matters. The issue saw its first development after passage of the recovery act when the United Mine Workers of America sought recognition at captive coal mines of steel companies. Through a decision of the former National Labor

Board, contracts were signed by steel company coal subsidiaries with the officials of the United Mine Workers. The contracts, however, were made with officials of the union as spokesmen for its members but not with the union itself—the difference between “dealing” with the union representatives and recognition of the union. The action was taken after intervention by President Roosevelt.

Republic Plant Under Fire

Discrimination and denial of collective bargaining rights are alleged in a complaint by the Amalgamated against the Republic Steel Corp., at its Warren, Ohio, plant. These charges were denied by the company both at conferences with the National Steel Labor Relations Board and in its brief. Amalgamated members in seeking to make the most of these cases meanwhile have announced that the Bethlehem Steel Co. has agreed to deal with one of its committees at the Sparrows Point, Md., plant.

There has been great activity on the part of the association ever since the recovery act was passed. It has driven strongly for union recognition, thus seeking to go beyond the past practice of simply having the steel industry deal with it. During the summer it made a gesture of a general strike in the industry—and found the gesture would not work. Moreover, its more conservative members, including the higher ranking officials, clearly became frightened lest the radicals would bore from within and take over the union, or entirely destroy it and supplant it with a left

wing organization made up of irresponsible agitators.

New Labor Decisions Were Encouraging

While activities were carried on, the association did not renew its drive to a high pitch until it scored victories under the new labor board policies, climaxed especially by the majority representation ruling of the National Labor Relations Board decision in the Houde case. Largely on this case is the union basing its efforts for outright recognition, so stoutly resisted by the industry. The move of course is only a partial one in the full sweep of the American Federation of Labor in its broad campaign for recognition and more power, a campaign marked by widespread strikes and violence as the country struggles to find a way to recovery.

This is not to say that labor is not making some just demands in certain industries where strikes are occurring. The point is that organized labor is

making a strong bid for further control, and there is no doubt that it has forced many into the ranks of strikers who would much prefer to be at their benches making a living for themselves and families. Some, however, with Government encouragement, are of a different stripe. Feeling that they can agitate and strike, and yet be underwritten against loss of food and shelter, they "carry on" with complete abandon. Neither the losses of labor nor capital worry them.

Houde Company to Test Decision

Resistance on the part of industry has been accentuated by the majority representation ruling of the National Labor Relations Board. Not only has the Houde company refused to abide by the decision, but many industrialists have either openly or otherwise given support to the position of the company. The resistance the ruling faces is further indicated by the attitude of the board of directors of the National Association of Manufactur-

ers which in a statement issued in New York last week advised employers to ignore the decision. While administration officials have expressed vigorous resentment at the attitude of the National Association of Manufacturers and claim the ruling will be backed up to the limit, the point is made by opponents of the ruling that it is not a law. It remains to be tested in the courts. Therefore, it is held that charges that the association is encouraging law violation are utterly without foundation. On the contrary, it is argued that industry has a constitutional right to test the ruling, just as would labor, and it has been pointed out that had the ruling been in favor of proportional representation, organized labor probably would have taken the case to the courts.

National Board Backs Stand

Lloyd K. Garrison, chairman of the National Labor Relations Board, said last Friday that if industry declines to submit to regional board decisions the

National Association of Manufacturers Urges Industry to Ignore Houde Decision

WHILE the Houde Engineering Co., Buffalo, was announcing its intention of refusing to abide by the recent decision of the National Labor Relations Board providing for majority representation in employee collective bargaining, the directors of the National Association of Manufacturers issued the following statement urging industry unanimously to ignore the ruling:

The National Labor Relations Board in the so-called Houde case has made a decision of utmost importance to all employers and employees. The board holds that where elections by employees disclose that a majority have selected a particular agency for collective bargaining with management, minorities are thereafter prevented from exercising any right to bargain, and management may thereafter deal only with representatives of the majority.

The decision raises issues of perhaps greater importance to employees than to management, because it deprives them of the elementary right to dispose of their own labor on their own terms through representatives of their own choosing. It compels groups of employees to be represented by those whom they have not chosen.

In the opinion of our law department, the decision is unwarranted by the terms of the recovery act and is unenforceable.

The decision is not supported by the alleged precedents cited by the labor board. It flatly contradicts the interpretation of section 7-A of the recovery act made by the President in settling the automobile strike, and also the continuing interpretations by Administrator Johnson and General Counsel Richberg, upon all of which employers and employees relied and under which they have established relations with each other.

The policy fixed by the decision is, furthermore, unwise. It will increase labor disputes by stimulating controversies between different groups of workers as to

who is to deal with the employers and resentment by groups of workers against being deprived of their right to negotiate through representatives of their own choosing. This decision prohibits any minority group of workers from making mutually satisfactory wage and working agreements with employers.

Employers should negotiate with authorized representatives of any groups of their employees. Many individual workers prefer to negotiate directly with their employers regarding their own employment conditions and their wishes must be respected. This is particularly important since over 75 per cent of all employers employ not over 20 workers each.

Employers and employees properly insist that agreements with individuals or groups must be arrived at free from compulsion from any source.

We recommend that employers continue to abide by the long-standing and authoritative interpretations upholding the right of minority groups to deal with their employers previously made by the President, Administrator Johnson and General Counsel Richberg until competent judicial authority has declared otherwise.

In view of the policies and decisions of the National Labor Relations Board and regional labor boards throughout the country, we urge upon manufacturers the utmost caution in seeking or submitting to the jurisdiction of such boards.

The facilities of our Law Department are at the disposal of our members and cooperating associations for consultations and advice upon this subject at all times.

national board will nevertheless adhere to the majority representation plan and support regional boards in pursuing that policy. This comment was occasioned by the attitude of the National Association of Manufacturers, and was taken to mean that the board is prepared to go to the courts when its decisions are challenged. The board referred the Houde case to the NRA compliance division and the NRA has ordered the Blue Eagle removed from the company's plant in Buffalo and turned the case over to the Department of Justice for prosecution.

Proportional representation, of course, has been widely recognized. It was resorted to by the President in setting up the automobile labor board. However, Mr. Garrison pointed out that there is no inconsistency between this policy and the majority representation policy adopted by the National Labor Relations Board. He explained that there is nothing to prevent agreement between employers and their workers upon any plan satisfactory to both sides. The automobile labor board plan was arrived at through such agreement, though it is well known organized labor representatives—or at least some of its most prominent officials—were dissatisfied with the agreement.

Now that precedent for majority representation has been established, it is easy to believe that when the automobile labor board agreement expires after its year's existence organized labor will ask for acceptance by the automotive industry of the majority representation plan. Mr. Garrison conceded that the latter policy is inconsistent with the attitude of Gen. Hugh S. Johnson and Donald Richberg, who in a joint NRA memorandum vigorously upheld the minority group representation plan.

Mr. Garrison, however, has since announced his retirement from the chairmanship of the National Labor Relations Board and on Oct. 1, will return to his former position as dean of the law school of the University of Wisconsin.

In any event, organized labor is making the most of the Houde decision, both to gain the exclusive right of collective bargaining by majority representation and union recognition. The latter is likely to become an increasingly serious problem as organized labor gains victories from the decision. The fact remains that where industries have properly constituted company unions having majority representation, the decision would work to their advantage. Organized labor, seeing this, is especially active in renewing its membership drive, based on the potential power to be gathered from the decision. While at present it constitutes only a minority of the steel industry employees, it hopes to gain a majority control in collective bargaining and then compel recognition.

NRA Research and Planning Division Urges That Industrial Prices Be Lowered

WASHINGTON, Sept. 18. — Keeping down industrial prices is necessary in order to attain parity with agriculture, and fullest possible expansion of industrial activity is the key to jobs for unemployed millions. Such is the view of Leon Henderson, chief of the NRA research and planning division. Fitting in with his economic conception is opposition to price and production control. Both suggestions run counter to NRA policies, though they are less fixed than formerly. Shortened hours and increased wages obviously do not lend themselves to price reductions.

It is understood that the lifting of price and production control as urged by Mr. Henderson was so sharply in conflict with the view of Gen. Hugh S. Johnson, that Mr. Henderson some time ago offered his resignation. It has not been accepted. Mr. Henderson expressed his views on the heels of the "production control" program outlined by the American Federation of Labor. The Federation suggested the establishing by the Government—in all things these days Government bureaucracy must show its mailed fist—of a "central agency representing organized business, labor, consumers and Government to lay out a production program."

Contrary to A. F. of L. Program

This rather vague, and perhaps illusory, plan appears to run counter to that of Mr. Henderson and it may be added that the trend toward holding down prices and lifting control provisions in codes has gathered momentum. The AAA even has given indications that its agriculture control, crop limitation scheme was a washout. It took a sharp reminder from nature to convince the brain trust, if it has been convinced, that it cannot repeal natural forces.

The American Federation of Labor obviously has good precedent from industry itself in espousing the idea of controlled production. Mr. Henderson takes the opposite slant. He sees sharp resurgence of employment in lifting all control of output and holding down prices.

Correlation of its forces by NRA is looked upon by Mr. Henderson as the chief work lying ahead of the organization. Its type of reorganization is accepted as being of less importance than the work it is to do. Whether patterned after the proposal discussed at Hyde Park between President Roosevelt and General Johnson, calling for an executive, legislative and judicial branch, the belief was expressed that there will never be unemployment if the competitive system works.

With these purposes in mind the research and planning board has broken industries into two principal groups to make a study of the relationships between prices and production and prices and employment. Iron and steel, motor vehicles, cement and agricultural implements were cited as examples in the first group which are not subject to "radical change." Petroleum, agricultural commodities, and food products were cited as examples whose prices fluctuate widely.

To show marked contrasts, it was pointed out that from 1929 to 1934 the price decline in agricultural implements was 6 per cent while the drop in production was 80 per cent as against a price loss of 63 per cent and a production decline of 6 per cent in agricultural commodities. In order to strike a level with agriculture it was held that industrial prices must be held down.

Mr. Henderson said that the ratio of purchasing power going to labor has increased from 58.3 to 62.5 per cent under the recovery act. He contended that if that ratio is preserved and production is increased there will be more purchasing power to distribute.

In urging production control under Government supervision, the American Federation of Labor pointed to the uncertainty regarding prospects for business profits, failure to expand plants and output and therefore a heavy drop in purchasing power. Illustrating its argument it was stated that the country needs 5,000,000 new homes, yet built only 50,000 in 1933, while 11,000,000 want new automobiles with only 2,135,000 purchased in the year ended June, 1934.

Summarizing, the federation said:

1. Present measures for recovery, if they succeed, can restore business only over a long period of time. Meanwhile the growing Federal debt, the increasing demand for inflation, threaten the Federal credit structure on which the whole program depends.
2. The recovery program has as yet given us no way of adjusting production to the needs of our population; even if we recover, business activity will still depend to a large extent on the hopes and fears of millions of business men, acting as individuals, with no adequate information.
3. If we know our needs and if all cooperate in a definite program to produce for our needs, no individual business man or worker need curtail his spending for fear of the future.
4. The Government can set up necessary information; it can establish a central agency representing organized business, labor, consumers and Government to lay out a production program and carry it through.

which would provide a harboring place for rats, mice or germs. Recent experimentation suggests that glass wool may prove a satisfactory insulation for steel cellular construction, since it is non-organic, non-inflammable and apparently shatter-proof.

While light, corrosion-resistant metals have been suggested for this type of cellular construction, their use appears to be barred because of their cost. In the Navy, where stainless steel is being widely used in interiors, cost is less important than the necessity of keeping weight within treaty limitations. In passenger vessels, ship builders state, resistance to corrosion would not be a serious consideration except where the steel is exposed to the weather and there a relatively low alloy steel sheet might be used in place of the more expensive alloys. Such low alloy steels, however, have not yet been thoroughly tested for sea service.

The cost of interior metal construction cannot be materially reduced by the adoption of mass production methods, it is claimed. The possibility of making multiple steel pressings for doors and partitions is limited to the section of the vessel amidships, since the problems of camber and shear in the design of a vessel's superstructure result in a progressive change in dimensions as the ends of the boat are approached.

There are also limitations so far as the use of fireproof tapestries and up-

holstery is concerned. Asbestos wool, after being subjected to ship vibration for a time, flattens out and loses its softness. Besides, the real arbiters of the furnishings are the passengers. Will they be willing to sacrifice comforts and luxuries for greater safety? They cannot be forced to accept such a sacrifice by national legislation, because competition on the high seas is international. Such legislation, instead of achieving its end, might have the effect of driving more American passengers to foreign vessels.

Besides the problem of partitions, doors and furnishings, there is the question of deck coverings. To date wood is the only material that has proved its ability to provide necessary insulation and at the same time to withstand the extreme variations in heat and cold and the exposure to rain and salt air which are experienced at sea. Even Navy vessels still have wooden deck coverings.

If, however, the President's proposal should finally prove practicable, the additional steel or metal required in ocean liners would total 300 or 400 tons, it is estimated. Besides, there would be a larger market for metal furniture, cabinets, shelving, lockers, etc. Replacement of wood with metals, it is claimed, will not necessarily increase the weight of ships. In fact, a saving in weight may be effected, depending of course on the type of construction developed and the materials employed.

Two Small Steckel Cold Mills Ordered


THE Cold Metal Process Co., Youngstown, Ohio, has received contract from the Crucible Steel Co. of America for a 7½-in. Steckel mill, which will be installed at Crucible's Jersey City, N. J., plant. The mill, which is a new type with removable rolls and outside gear drive, will be used for rolling high carbon and stainless steels. The Cold Metal company has also received contract for another 7½-in. Steckel mill from the Signode Steel Strapping Co., Chicago, which will use the mill for rolling low carbon steel box strapping.

Applying of Plate and Shape Extras Postponed

NEW quantity extras on plates and shapes are to be applied Dec. 1 on sales for shipments beginning Jan. 1, 1935, instead of on sales for shipment on and after Oct. 1. Decision to postpone the effective date was made at a meeting in New York, Sept. 13, of the steel code authority. The change was made to provide interested parties with an opportunity to present their views. It is reported that the chief complaint against the new extras came from small fabricators.



FEW parts of an automobile engine require so high a degree of accuracy in manufacture as does the camshaft. Each cam must be not only perfect in contour, but perfectly positioned in relation to the other cams, in order that the twelve valves shall be uniform in their opening and closing and in their timing. In the Chevrolet motor plant, camshafts are produced on a series of highly developed automatic machines, remarkable for their accuracy. Then every shaft is subjected to a minute inspection before it can be placed in an engine. The illustration shows inspectors checking the shafts with the aid of dial micrometers, sensitive to one ten-thousandth of an inch.



NEWS OF THIS WEEK

British Iron and Steel Demand Is Improving

LONDON, ENGLAND, Sept. 18 (*By Cable*).—British pig iron consumption is increasing and deliveries to Scotland are the heaviest of this year. Forward buying has been resumed and the lighting of additional furnaces is now in prospect. Minimum quotations of East Coast hematite have been advanced one shilling per ton owing to the increased cost of ore and fuel, but makers are well booked with advance orders.

Continental competition in semi-finished steel is proving to be ineffective and English works are busy. The demand for finished steel is improving. South Africa has ordered 4000 tons of rails and substantial business is being done with China and the Far East. Russia is said to be negotiating a further supply of pipe.

Exports of pig iron from the United Kingdom for August were 11,675 tons, of which 150 tons were shipped to the United States. Total exports of iron and steel aggregated 193,412 tons.

The tin plate market is still unsettled owing to agreement conditions and home trade is quiet in this commodity but export demand is growing, especially from Australia. Orders in hand total about 4,000,000 boxes and output is being maintained at above 70 per cent of capacity.

The Continental iron and steel market is fairly satisfactory except for sheets which are improving. Bars are in demand. Good business is being had from China, Japan and India. Because Japan is unable to fulfill delivery on a Mexican pipe contract for 25,000 tons, the business is now being shared by German and French firms.

The threatened strike of Belgian coal miners has been averted by Government intervention.

ered by A.S.T.M. specifications 149 and 150, 2 in. thick and under carry an extra of 90c. for flange quality and 95c. for fire box quality. The latter quality for fusion welding has a \$1.20 extra which includes a 50c. extra for plates 2 in. to 4 in. thick.

No standard extras have been used for these products since the specifications were adopted a year or two ago, as mills did not have data on which to compute costs. However, some of the producers have been quoting extras at 40c., 45c. and 95c. respectively, for the three grades.

Non-Ferrous Foundry Papers of Interest

PRACTICAL papers will feature the non-ferrous sessions at the fifth International Foundry Congress and thirty-eighth annual convention of the American Foundrymen's Association, to be held in the Convention Hall, Philadelphia, Oct. 22 to 26. Besides the general interest sessions, such as those on refractories, sand control, materials handling, and apprentice training, there are to be two technical meetings on non-ferrous castings, and a round table luncheon for discussion of problems.

Three papers will be given at the general session on non-ferrous castings. The ever-present difficulty of porosity in castings will be discussed in detail by A. W. Lorenz, Bucyrus-Erie Co., Milwaukee, in his paper on "Porosity in Leaded Bronze Bushings." Mr. Lorenz will give the results of his experience with this defect, and his method of approaching the problem. He constructed a mold in which he could watch the metal currents, and thus was able to change the gating in such a way as to overcome the porosity.

R. R. Kennedy, metallurgist, material division, War Department, Wright Field, Dayton, Ohio, will have a paper on the "Effect of Elevated Temperatures on the Strength and Dimensional Stability of Certain Alu-

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9	
Billets, open-hrth.	£5 10s.	to £5 15s.
Tin plate, per base box	18s.	2d.
Steel bars, open-hearth	£7 17½s.	
Beams, open-hrth.	£7 7½s.	
Channels, open-hearth	£7 12½s.	
Angles, open-hearth	£7 7½s.	
Black sheets, No. 24 gage.....	£9 5s.	
Galvanized sheets, No. 24 gage.....	£11 5s.	

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas...	£2 7s.	
Wire rods, No. 5 B.W.G.	£4 10s.	
Steel bars, merchant	£3 5s.	
Sheet bars	£2 8s.	
Plates, ¼ in. and up	£4	
Plates, 3/16 in. and 5 mm.....	£4 2s.	6d.
Sheets, ¼ in.....	£4 7s.	6d.
Beams, Thomas...	£3 2s.	6d.
Angles (Basic)...	£3 2s.	6d.
Hoops and strip base	£4 2s.	6d.
Wire, plain, No. 8	£5 7s.	6d.
Wire nails.....	£5 15s.	
Wire, barbed, 4-pt. No. 10 B.W.G....	£8 15s.	

New Extras on High Tensile Steel Plates

NEW extras for high tensile strength plates for very high pressure work and for electrically welded pressure vessels making an advance up to \$10 a ton become effective Oct. 1, being included in the new lists of extras issued by the American Iron and Steel Institute. Plates cov-

minum Alloys Used in Aircraft." He has made a very intensive study of the effects of different temperatures, different lengths of time, on the various properties of aluminum alloys. His results indicate fields of application for certain alloys, based on the influence of heat on the physical properties.

"Melting Non-ferrous Alloys in a Cupola-Type Furnace" is the subject of a paper by W. C. Alvin, Imperial Brass Mfg. Co., Chicago. He will speak as a user, and will tell the story of his work with this type of melting equipment. He takes up the alloys best suited to the cupola, the advantages and disadvantages of this equipment, the refractories found most efficient, and gives a clear picture of one company's experience with cupola melting of red brass.

The second technical session is a symposium on the deoxidation and degasification of non-ferrous casting alloys. This subject, one of the most important to the industry, has been determined upon as one to be discussed annually until some definite conclusion is reached. This meeting is the second annual session on this topic.

Recognized authorities will discuss the deoxidation of different kinds of non-ferrous casting alloys, advancing opinions as to the theory involved, and giving the results of their use of methods and materials for this purpose. The introduction, and "Discussion of General Principles," will be given by Dr. C. H. Lorig, Battelle Memorial Institute, Columbus, Ohio. A report on the deoxidation and degasification of bronze foundry alloys will be made by O. W. Ellis, director of metallurgical research, the Ontario Research Foundation, Toronto, Ont., as chairman of a committee studying that subject. L. A. Ward, metallurgist, Chase Brass & Copper Co., Waterbury, Conn., will discuss "Yellow Brass Castings Alloys." "Aluminum and Its Alloys" will be taken up by H. J. Rowe, Aluminum Company of America, Cleveland.

Structural Steel Institute to Meet

THE twelfth annual convention of the American Institute of Steel Construction, Inc., will be held at the Edgewater Beach Hotel, Chicago, Oct. 24 to 26. The meeting is an important one and all members of the industry, whether they are members of the institute or not, are being urged to attend.

A complete report on the code situation will be made and a program that will contain discussions of other matters of benefit has been arranged. V. G. Iden, 200 Madison Avenue, New York, is secretary.

PERSONALS

H. A. HOUSTON has been appointed assistant to the general manager of the United Engineering & Foundry Co., Pittsburgh. He joined the company in October, 1933. He was born in Springfield, Mo., and was formally educated at Purdue University and the University of Illinois. He has had a broad engineering experience, particularly in the railway engineering field. During the World War he was major of engineers, military railways, and served 18 months as aid to Samuel L. Felton, director general. Mr. Houston was at one time manager of mechanical parts, railway equipment engineering department, of the old Westinghouse Electric & Machine Co., and also works manager of the R. D. Nuttall plant.

MAX RACHWALSKY, associated with E. H. Jones Machine Tools, Ltd., London, England, arrived in New York Sept. 12, and expects to establish connections for the sale of American machine tools in Great Britain.

CHARLES A. LIDDLE, president of the Pullman Car Mfg. Corp., has been elected to the board of directors of the American National Bank & Trust Co., Chicago.

G. V. WOODY, formerly associated with National Transit Pump & Machine Co., New York, has been appointed district sales manager for Allis-Chalmers Mfg. Co., Park Building, Pittsburgh.

H. W. RINEARSON, formerly vice-president in charge of sales for A. M. Byers Co., has been appointed president of the Shaw-Perkins Mfg. Co., with headquarters in the Oliver Building, Pittsburgh. Prior to his connection with the Byers company, he had been general manager of the Armco Culvert Manufacturers Association at Middletown, Ohio.

A. M. DOUGLAS, Chicago district manager, Maynard Electric Steel Casting Co., Milwaukee, will leave Dec. 11 for Sydney, Australia, on business. He is prepared to attend to business matters for concerns with customers in Australia, and arrangements may be made through O. H. SCHILDKNECHT, sales manager of the Maynard company. As a former resident of Australia, Mr. Douglas is familiar with the country, more especially the western part.

H. S. MCPHERSON, who has been identified for the past 15 years with the United States Rubber Products, Inc., New York, part of that time in charge of mechanical sales in the Boston district, has been appointed

manager of mechanical sales in the St. Louis district. He is being succeeded at Boston by W. G. MUELLER, who has been associated with the company for more than 25 years.

N. N. FRITZ, identified with Ajax Tool Steel Sales, 114 Liberty Street, New York, has been appointed eastern United States representative for the Poldi Steel Works of Czechoslovakia. He was associated for eight years with the former Poldi Steel Corp., New York, and, in his new capacity, will handle similar products. The Tool Steel Service Co., 1627 West Austin Avenue, Chicago, has taken over the office and warehouse of the former Poldi company in the Middle West.

ARTHUR J. BRANDT has been named assistant general manager of the Hupp Motor Car Corp., Detroit. He is nationally known in engineering and manufacturing circles.

ALEXANDER C. BROWN has resigned as president of the Industrial Brownhoist Corp., Bay City, Mich., and has been elected first vice-president of the Cleveland-Cliffs Iron Co., Cleveland. On his graduation from Case School of Applied Science, Cleveland, Mr. Brown became connected with the Brown Hoisting Machinery Co., Cleveland, founded by his father, and became its president in 1918. When the company was merged with the Industrial Works, Bay City, Mich., he was elected president of the merged company. After this merger the Cleveland plant was removed to Bay City. In addition to other business connections Mr. Brown has long been prominent in civic activities in Cleveland. W. R. GEFFINE, secretary of the Cleveland-Cliffs Iron Co., has been elected a vice-president. He will retain his former duties as secretary.

MELVIN E. PATTISON has been elected president and treasurer, Industrial Brownhoist Corp., Bay City, Mich., succeeding ALEXANDER C. BROWN. He has been executive vice-president and secretary. Other promotional changes have been made in this corporation following Mr. Brown's resignation. E. S. CLARK, who has been a director, has been elected secretary. HOYT E. HAYES, export sales manager and in charge of sales in the Cleveland District, has been elected vice-president and sales manager. GEORGE A. LONG, who was plant manager, has been made vice-president in charge of manufacturing, and E. W. TAYLOR has been reelected vice-president in charge of engineering and purchases.



THIS WEEK IN WASHINGTON

Labor Renews Unionization Efforts

Majority Representation Decision in Houde Case Leads To Increased Activity in Steel Industry—Manufacturers Prepare For Showdown

WASHINGTON, Sept. 18.—Hailing as a sweeping victory the majority representation ruling by the National Labor Relations Board in the case of the Houde Engineering Corp., organized labor through the Amalgamated Association of Iron, Steel and Tin Workers is pressing hard for union recognition in the iron and steel industry. Already victorious in elections at the plants of the West Virginia Rail Co. and the Apollo Steel Co., supervised by the National Steel Labor Relations Board, the association is actively trying to consolidate its forces for pending drives in the largest units in the industry, the United States Steel Corp., the Republic Steel Corp. and the Bethlehem Steel Co.

In the South, the first move by the association since the Houde decision has been made at the plant of the Gulf States Steel Co., Alabama City, Ala. Last Friday hearings were held in connection with claims that workers at the plant had been discharged for union activity. More important from their point of view, members of the association charged denial of the right of collective bargaining.

Other Hearings in October

In the first week of October, a hearing will be held at Pittsburgh before the National Steel Labor Relations Board on the petition of Amalgamated workers at the McDonald, Ohio, plant of the Carnegie Steel Co., where last June an election gave a strong victory to the company union. The pending petition asks for a new election to de-

By L. W. MOFFETT
Resident Washington Editor, THE IRON AGE

termine collective bargaining representation, the association seeking to upset the prior election on the ground that the company union does not represent the workers within the meaning of Section 7-A of the Recovery Act. Especial importance is being given this petition by the association inasmuch as it concerns a large subsidiary of the largest unit in the steel industry.

Reports have it that the union has been unusually busy in organizing and that it believes it would register a victory if another election were held. In this connection the decisions of both the National Labor Relations Board and the National Steel Labor Relations Board are undoubtedly depended upon by organized labor to stimulate anew its campaign to muster additional members and it may be expected that the formidable drive already under way to gain control of labor in the iron and steel industry will be pushed to the limit.

Recognition is of course the end sought, though dealing with organized labor and recognizing it as such obviously are different matters. The issue saw its first development after passage of the recovery act when the United Mine Workers of America sought recognition at captive coal mines of steel companies. Through a decision of the former National Labor

Board, contracts were signed by steel company coal subsidiaries with the officials of the United Mine Workers. The contracts, however, were made with officials of the union as spokesmen for its members but not with the union itself—the difference between “dealing” with the union representatives and recognition of the union. The action was taken after intervention by President Roosevelt.

Republic Plant Under Fire

Discrimination and denial of collective bargaining rights are alleged in a complaint by the Amalgamated against the Republic Steel Corp., at its Warren, Ohio, plant. These charges were denied by the company both at conferences with the National Steel Labor Relations Board and in its brief. Amalgamated members in seeking to make the most of these cases meanwhile have announced that the Bethlehem Steel Co. has agreed to deal with one of its committees at the Sparrows Point, Md., plant.

There has been great activity on the part of the association ever since the recovery act was passed. It has driven strongly for union recognition, thus seeking to go beyond the past practice of simply having the steel industry deal with it. During the summer it made a gesture of a general strike in the industry—and found the gesture would not work. Moreover, its more conservative members, including the higher ranking officials, clearly became frightened lest the radicals would bore from within and take over the union, or entirely destroy it and supplant it with a left

wing organization made up of irresponsible agitators.

New Labor Decisions Were Encouraging

While activities were carried on, the association did not renew its drive to a high pitch until it scored victories under the new labor board policies, climaxed especially by the majority representation ruling of the National Labor Relations Board decision in the Houde case. Largely on this case is the union basing its efforts for outright recognition, so stoutly resisted by the industry. The move of course is only a partial one in the full sweep of the American Federation of Labor in its broad campaign for recognition and more power, a campaign marked by widespread strikes and violence as the country struggles to find a way to recovery.

This is not to say that labor is not making some just demands in certain industries where strikes are occurring. The point is that organized labor is

making a strong bid for further control, and there is no doubt that it has forced many into the ranks of strikers who would much prefer to be at their benches making a living for themselves and families. Some, however, with Government encouragement, are of a different stripe. Feeling that they can agitate and strike, and yet be underwritten against loss of food and shelter, they "carry on" with complete abandon. Neither the losses of labor nor capital worry them.

Houde Company to Test Decision

Resistance on the part of industry has been accentuated by the majority representation ruling of the National Labor Relations Board. Not only has the Houde company refused to abide by the decision, but many industrialists have either openly or otherwise given support to the position of the company. The resistance the ruling faces is further indicated by the attitude of the board of directors of the National Association of Manufactur-

ers which in a statement issued in New York last week advised employers to ignore the decision. While administration officials have expressed vigorous resentment at the attitude of the National Association of Manufacturers and claim the ruling will be backed up to the limit, the point is made by opponents of the ruling that it is not a law. It remains to be tested in the courts. Therefore, it is held that charges that the association is encouraging law violation are utterly without foundation. On the contrary, it is argued that industry has a constitutional right to test the ruling, just as would labor, and it has been pointed out that had the ruling been in favor of proportional representation, organized labor probably would have taken the case to the courts.

National Board Backs Stand

Lloyd K. Garrison, chairman of the National Labor Relations Board, said last Friday that if industry declines to submit to regional board decisions the

National Association of Manufacturers Urges Industry to Ignore Houde Decision

WHILE the Houde Engineering Co., Buffalo, was announcing its intention of refusing to abide by the recent decision of the National Labor Relations Board providing for majority representation in employee collective bargaining, the directors of the National Association of Manufacturers issued the following statement urging industry unanimously to ignore the ruling:

The National Labor Relations Board in the so-called Houde case has made a decision of utmost importance to all employers and employees. The board holds that where elections by employees disclose that a majority have selected a particular agency for collective bargaining with management, minorities are thereafter prevented from exercising any right to bargain, and management may thereafter deal only with representatives of the majority.

The decision raises issues of perhaps greater importance to employees than to management, because it deprives them of the elementary right to dispose of their own labor on their own terms through representatives of their own choosing. It compels groups of employees to be represented by those whom they have not chosen.

In the opinion of our law department, the decision is unwarranted by the terms of the recovery act and is unenforceable.

The decision is not supported by the alleged precedents cited by the labor board. It flatly contradicts the interpretation of section 7-A of the recovery act made by the President in settling the automobile strike, and also the continuing interpretations by Administrator Johnson and General Counsel Richberg, upon all of which employers and employees relied and under which they have established relations with each other.

The policy fixed by the decision is, furthermore, unwise. It will increase labor disputes by stimulating controversies between different groups of workers as to

who is to deal with the employers and resentment by groups of workers against being deprived of their right to negotiate through representatives of their own choosing. This decision prohibits any minority group of workers from making mutually satisfactory wage and working agreements with employers.

Employers should negotiate with authorized representatives of any groups of their employees. Many individual workers prefer to negotiate directly with their employers regarding their own employment conditions and their wishes must be respected. This is particularly important since over 75 per cent of all employers employ not over 20 workers each.

Employers and employees properly insist that agreements with individuals or groups must be arrived at free from compulsion from any source.

We recommend that employers continue to abide by the long-standing and authoritative interpretations upholding the right of minority groups to deal with their employers previously made by the President, Administrator Johnson and General Counsel Richberg until competent judicial authority has declared otherwise.

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Now that precedent for majority representation has been established, it is easy to believe that when the automobile labor board agreement expires after its year's existence organized labor will ask for acceptance by the automotive industry of the majority representation plan. Mr. Garrison conceded that the latter policy is inconsistent with the attitude of Gen. Hugh S. Johnson and Donald Richberg, who in a joint NRA memorandum vigorously upheld the minority group representation plan.

Mr. Garrison, however, has since announced his retirement from the chairmanship of the National Labor Relations Board and on Oct. 1, will return to his former position as dean of the law school of the University of Wisconsin.

In any event, organized labor is making the most of the Houde decision, both to gain the exclusive right of collective bargaining by majority representation and union recognition. The latter is likely to become an increasingly serious problem as organized labor gains victories from the decision. The fact remains that where industries have properly constituted company unions having majority representation, the decision would work to their advantage. Organized labor, seeing this, is especially active in renewing its membership drive, based on the potential power to be gathered from the decision. While at present it constitutes only a minority of the steel industry employees, it hopes to gain a majority control in collective bargaining and then compel recognition.

NRA Research and Planning Division Urges That Industrial Prices Be Lowered

WASHINGTON, Sept. 18. — Keeping down industrial prices is necessary in order to attain parity with agriculture, and fullest possible expansion of industrial activity is the key to jobs for unemployed millions. Such is the view of Leon Henderson, chief of the NRA research and planning division. Fitting in with his economic conception is opposition to price and production control. Both suggestions run counter to NRA policies, though they are less fixed than formerly. Shortened hours and increased wages obviously do not lend themselves to price reductions.

It is understood that the lifting of price and production control as urged by Mr. Henderson was so sharply in conflict with the view of Gen. Hugh S. Johnson, that Mr. Henderson some time ago offered his resignation. It has not been accepted. Mr. Henderson expressed his views on the heels of the "production control" program outlined by the American Federation of Labor. The Federation suggested the establishing by the Government—in all things these days Government bureaucracy must show its mailed fist—of a "central agency representing organized business, labor, consumers and Government to lay out a production program."

Contrary to A. F. of L. Program

This rather vague, and perhaps illusory, plan appears to run counter to that of Mr. Henderson and it may be added that the trend toward holding down prices and lifting control provisions in codes has gathered momentum. The AAA even has given indications that its agriculture control, crop limitation scheme was a washout. It took a sharp reminder from nature to convince the brain trust, if it has been convinced, that it cannot repeal natural forces.

The American Federation of Labor obviously has good precedent from industry itself in espousing the idea of controlled production. Mr. Henderson takes the opposite slant. He sees sharp resurgence of employment in lifting all control of output and holding down prices.

Correlation of its forces by NRA is looked upon by Mr. Henderson as the chief work lying ahead of the organization. Its type of reorganization is accepted as being of less importance than the work it is to do. Whether patterned after the proposal discussed at Hyde Park between President Roosevelt and General Johnson, calling for an executive, legislative and judicial branch, the belief was expressed that there will never be unemployment if the competitive system works.

With these purposes in mind the research and planning board has broken industries into two principal groups to make a study of the relationships between prices and production and prices and employment. Iron and steel, motor vehicles, cement and agricultural implements were cited as examples in the first group which are not subject to "radical change." Petroleum, agricultural commodities, and food products were cited as examples whose prices fluctuate widely.

To show marked contrasts, it was pointed out that from 1929 to 1934 the price decline in agricultural implements was 6 per cent while the drop in production was 80 per cent as against a price loss of 63 per cent and a production decline of 6 per cent in agricultural commodities. In order to strike a level with agriculture it was held that industrial prices must be held down.

Mr. Henderson said that the ratio of purchasing power going to labor has increased from 58.3 to 62.5 per cent under the recovery act. He contended that if that ratio is preserved and production is increased there will be more purchasing power to distribute.

In urging production control under Government supervision, the American Federation of Labor pointed to the uncertainty regarding prospects for business profits, failure to expand plants and output and therefore a heavy drop in purchasing power. Illustrating its argument it was stated that the country needs 5,000,000 new homes, yet built only 50,000 in 1933, while 11,000,000 want new automobiles with only 2,135,000 purchased in the year ended June, 1934.

Summarizing, the federation said:

1. Present measures for recovery, if they succeed, can restore business only over a long period of time. Meanwhile the growing Federal debt, the increasing demand for inflation, threaten the Federal credit structure on which the whole program depends.

2. The recovery program has as yet given us no way of adjusting production to the needs of our population; even if we recover, business activity will still depend to a large extent on the hopes and fears of millions of business men, acting as individuals, with no adequate information.

3. If we know our needs and if all cooperate in a definite program to produce for our needs, no individual business man or worker need curtail his spending for fear of the future.

4. The Government can set up necessary information; it can establish a central agency representing organized business, labor, consumers and Government to lay out a production program and carry it through.

Industrial Leaders Attend Conference With Federal Housing Administration

WASHINGTON, Sept. 18.—That the Federal housing program has aroused nation-wide interest is evident from the large attendance of industrial executives at a conference held last week with officials of the Federal Housing Administration. Included in nine groups of manufacturing executives who met here last Thursday were representatives of steel interests, radiator manufacturers, hardware producers and dealers, and numerous others. Various features of the housing campaign were discussed and explanatory talks given by directors of the several divisions of the FHA.

It is realized by FHA that the volume of business will depend almost entirely on the sales promotional facilities that are put forth by industrial interests with FHA support and sponsorship. To get such effort under way FHA has organized an industrial division which is establishing contact with every group, not only with those who are directly connected with the building industry, but all outside industrial and manufacturing groups as well. Among the groups set up is one on structural steel and steel products.

Steel to Be Required

Under the modernization plan the chief demand for iron and steel and related lines promises to come from such items as pipe, sheets, nails, plumbing fixtures, radiators, etc., most of the steel items being handled through jobbers. Obviously, production will call for scrap and pig iron.

Albert L. Deane, deputy administrator, explained how these groups can tie into the program and how the efforts of their organizations can be thrown into making the campaign a success. Perhaps the most direct results, he thinks, can be expected from the activities within each community. Such activities are being carried forward as community campaigns, sponsored by outstanding leaders, and with the cooperation and support of every private group in the community. Already, it was stated, more than 1000 cities have started to organize for such campaigns and new cities are coming in at the rate of 25 to 30 a day. Mr. Deane said that industrial groups have repeatedly expressed the opinion that the program is the first one in years in which they are enthusiastically putting forth their efforts with the feeling that they are not only helping in a constructive movement but may expect to reap a reward in results commensurate with the effort put forth.

Mr. Deane said that conservative estimates show that by reason of

delayed repairs and improvement on property there is a backlog of not less than \$1,500,000,000 of vitally necessary work that should be undertaken at once. Emphasizing the soundness of the credit plan, Mr. Deane said that more than 6000 financial institutions have been approved and are prepared to make loans to property owners.

The present program is preliminary to the home mortgage plan to be used as the medium for home building, expected to get under way next spring or summer. It remains to be seen what importance the steel house or the steel frame house may play in this program.

Large Attendance

Among those attending group conferences with FHA officials last week were: Bennett Chapple, vice-president, American Rolling Co., Middletown, Ohio; Chester H. Lehman, secretary, Blaw-Knox Co., Pittsburgh; H. G. Walton, general manager of sales, Bethlehem Steel Co., Bethlehem, Pa.; E. R. Leonard, Bethlehem Steel Co., Washington; T. R. Herbert, president, Consolidated Expanded Metal Co., Wheeling, W. Va.; John J. Lane, Consolidated Expanded Steel Co., Washington; R. S. Bishop, manager contract sales, Detroit Steel Products Co., Detroit; Alice Wessels, secretary, Goldsmith Metal Lath Co., Cincinnati;

C. E. Slawson, Jones & Laughlin Steel Corp., Washington; Louis Kuehn, president, Milcor Steel Co., Milwaukee; E. L. Lipman, comptroller, Milcor Steel Co., Milwaukee; Greer McIlvane, president, National Fireproofing Co., Pittsburgh; Ralph E. Meeder, manager, Penn Metal Co., New York; Edgar A. Rogers, Republic Steel Corp., Washington; F. S. Rutherford, Republic Steel Corp., Washington; C. Pvary, sales promotion, Stran-Steel Corp., Detroit; C. A. Strand, president, Stran-Steel Corp., Detroit; Joseph E. Hill, Truscon Steel Co., Washington; C. A. Avant, Youngstown Sheet & Tube Co., Youngstown; W. E. Watson, vice-president, Youngstown Sheet & Tube Co., Youngstown; L. F. Rains, president, A. M. Byers Co., Pittsburgh; I. H. Jones, secretary, Utica Radiator Corp., Utica, N. Y.; D. E. Lindemann, United States Pipe & Foundry Co., Washington; G. Allen Nelson, president, Fiat Metal Mfg., Chicago; James P. Harper, Sloan Valve Co., Chicago; William Hogen-son, president, Chicago Vitreous Enamel Products Co., Cicero, Ill.; J. L. O'Brien, general manager, Cleveland Steel Products Corp., Cleveland; Walter S. Johnson, manager, American Hardware Corp., New Britain, Conn.; W. G. Carey, Jr., Yale & Towne Mfg. Co., New York; Charles L. Heizmann, president, Earle Hardware Mfg. Co., Reading, Pa.; M. J. Donahue, Anchor Post Fence Co., Baltimore; Edward A. Meany, sales engineer, Columbia Steel Products, Washington; W. N. McCord, sales manager, General Air Conditioning Corp., Wash- ington.

Wire Reinforcing Industry Placed Under Steel Code—Other Code Developments

WASHINGTON, Sept. 18.—The NRA has announced an order placing the wire reinforcing industry under the approved code for the iron and steel industry.

In addition to a revised definition of the industry, the order establishes basing points for industry products, namely: Pittsburgh; Anderson, Ind.; Chicago, and the Pacific Coast ports enumerated in schedule F of the code.

The order also provides additional time for members of the wire reinforcing industry to comply with certain requirements of the basic code, for which the time limits for compliance already have expired.

REINFORCING MATERIALS FABRICATING

The code authority for the reinforcing materials fabricating industry has petitioned the NRA for modification of its approved code. One of the proposed amendments would revise the present section covering the administration's right to disapprove or modify any action taken by the industry's board of

directors (code authority), by bringing this section more into line with other codes recently approved.

Another proposal would empower the code authority to prepare a budget for administration approval; to collect assessments from industry members for code administration support; and to make expenditures called for under the budget. Objections to the proposed code modification must be submitted to room 4035, Department of Commerce building, before Sept. 29.

ROLLING STEEL DOOR INDUSTRY

Any objections to a proposed \$4,200 budget for the support of code administration in the rolling steel door industry for 1934, must be submitted to room 4029, Department of Commerce building, prior to Sept. 24. It is proposed that members of the industry contribute, each month, five-tenths of one per cent of the gross invoiced value of industry products, including erection thereof, shipped during the preceding month.

The industry also asks termination of the exemption granted under paragraph 3, of Administrative Order X-36, which relieves members of an industry or trade from the necessity of contributing toward the support

of any code except that covering their principal line of business. Objections to this also must be submitted under the above conditions.

SCRAP CODES

The code authorities for administrative agencies under the code of the scrap iron, non-ferrous scrap metals and waste materials trade have proposed a change in the announced basis of contribution to code expenses. As a result the NRA has announced that Sept. 25, instead of Sept. 17, will be the time limit for filing objections, criticisms or suggestions.

The basis of contribution originally suggested for members of the trade was 1/20 of 1 per cent of the gross volume of business. The new proposal would establish graduated assessments on business from \$500,000 and less, to \$3,000,000 and more.

A correction in the budget for the cotton rag trade also was noted. Originally, it was given as \$368,310. It should have been \$68,000.

GRAY IRON FOUNDRY

Any objections to proposed modifications of the approved code for the gray iron foundry industry, must be submitted to room 4023, Department of Commerce building, prior to Sept. 27. The modifications are in accordance with Office Order 228, and relate to accounting, sales below cost and price list filing. They have been proposed to enable certain groups within the industry to have open price list filing.

FOUNDRY EQUIPMENT BUDGET

The code authority for the foundry equipment industry has applied for approval of its budget, and of the basis of contribution by members of the industry to the expense of administering the code. The total amount of the budget is \$12,996. The proposed assessment, which would be payable quarterly in advance, follows:

"The annual assessment against each member of the foundry equipment industry for the expense of operating the code authority shall be three-tenths of one per cent of all annual sales (including repair parts) for such member averaged for the preceding five calendar years, with the following exceptions: (a) Sales reported to other industrial codes; (b) any sales of other products not manufactured or sold for like service by any member of this industry; (c) sales to firms outside the United States and Canada."

Notice has been given that any criticisms of, objections to, or suggestions concerning this request of the code authority must be made to room 406, 1518 K Street, N. W., Washington, before Sept. 27.

ALUMINUM PISTON CASTINGS AND FORGING

Public hearings on proposed supplemental codes of fair competition for the aluminum piston castings and forging industries will be held Sept. 24, in room 127, Willard Hotel, Washington. Both proposed codes embody only trade practice provisions. They are supplementary to and adopt provisions of the basic code for the aluminum industry, which establishes a maximum 40-hour week, with minimum rates of 30c. an hour in the South and 35c. in the North.

SECONDARY ALUMINUM BUDGET

The secondary aluminum industry code authority has submitted modifications of its code to provide for a budget and the basis of contribution to same by industry members. It also seeks termination of the exemption in Administrative Order X-36, under which firms are freed from contributing to expenses of any code except that covering their principal line of business. The total amount of the

proposed budget is \$17,460. The basis of assessment is 50c. a net ton of finished secondary aluminum and its alloys, this to be paid monthly on shipments of the previous month.

NON-FERROUS AND STEEL CONVERTER MANUFACTURING

Approval of an order terminating the exemption granted under paragraph 3, of Administrative Order X-36, insofar as it affects the non-ferrous and steel converter manufacturing industry has been announced. The order of termination applies only to those who manufacture products of the industry for sale as such. The paragraph which has been excepted, frees members of an industry or trade from the necessity of contributing to the support of any code other than that which embraces their principal lines of business.

HYDRAULIC MACHINERY

Any objections to a request by the code authority for the hydraulic machinery industry, a division of the machinery and allied products industry, for termination of the exemption granted under paragraph 3, of Administrative Order X-36, must be submitted to room 3074, Department of Commerce building, prior to Sept. 25.

STEEL WOOL

Approval of an order permitting the trade practice complaints committee, set up by the code authority for the steel wool industry, to handle trade practice complaints within the industry has been announced. The members of the committee are: Melville G. Steinhart, president, American Steel Wool Mfg. Co., New York; George W. Brooks, general manager, Eagle Steel Wool Co., Chicago; Arthur J. Roth, president, James H. Rhodes & Co., Chicago; Milton B. Loeb, president, Brillo Mfg. Co., Brooklyn; Henry C. Bosch, vice-president, International Steel Wool Co., Springfield, Ohio; and William H. Robbins, president, Williams Co., London, Ohio.

CODE AUTHORITIES RECOGNIZED

The NRA has announced its recognition of the following code authorities:

Steel Joist Industry: George F. Bateson, Truscon Steel Co., Youngstown; James F. Curley, Concrete Steel Co., New York; A. P. Clark, Kalman Steel Corp., Bethlehem, Pa.; William Zabriskie, Gabriel Steel Co., Detroit; J. H. Verschleiser, Laclede Steel Co., St. Louis; W. R. Guest, Ingalls Steel Products Co., Birmingham; and P. E. Griffith, Bates Expanded Steel Corp., East Chicago, Ind.

Steel Shipments to Territories Increase

THE United States shipped 62,059 gross tons of iron and steel products to its non-contiguous territories during the first seven months of this year, a gain of 12,559 tons over the corresponding period of last year, and 12,381 tons in advance of the total for the corresponding period of 1932, according to Ralph L. Harding, chief, Iron and Steel Division, Bureau of Foreign and Domestic Commerce.

Hawaii was the leading outlet, accounting for 33,482 tons against 28,690 tons in 1933 and 31,318 tons in 1932, followed by Puerto Rico which took 17,167 tons against 11,323 tons and 10,213 tons, while shipments to

Alaska amounted to 11,410 tons against 9,487 tons and 8,147 tons.

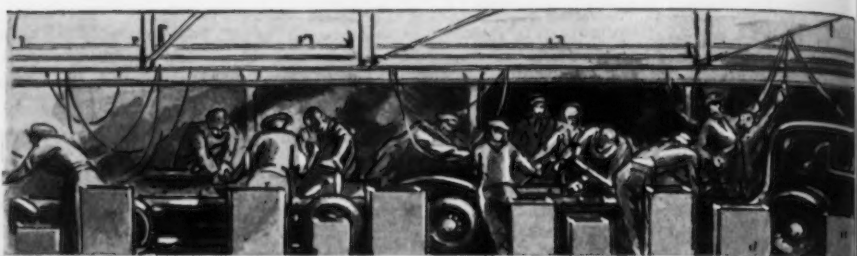
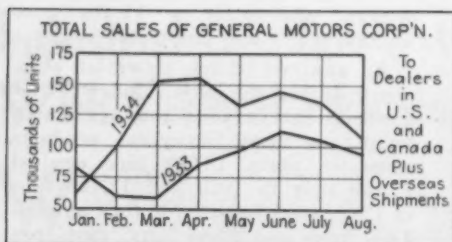
An analysis of the Hawaiian shipments during the period under review discloses that, from a tonnage standpoint, the more important products were tin plate, 18,781 tons against 17,740 tons in 1933 and 13,729 tons in 1932; steel bars, 3,766 tons against 2,037 tons and 2,865 tons; cast iron pressure pipe, 2,771 tons against 948 tons and 2,098 tons; heavy rails, 1,524 tons against 259 tons and 21 tons; welded galvanized steel pipe, 1,275 tons against 777 tons and 767 tons; plain structural shapes, 1,252 tons against 1,003 tons and 1,635 tons; galvanized steel sheets, 1,133 tons against 1,147 tons and 1,311 tons; other plate, not fabricated, 967 tons against 971 tons and 512 tons; structural shapes, fabricated, 641 tons against 57 tons and 1,411 tons; and wire nails, 519 tons against 423 tons and 569 tons.

Strength of Steel At Low Temperatures

A CONTRIBUTION on the tensile strength of steels at low temperatures was made by G. Gruschka to *Stahl und Eisen*, July 19. Tests at temperatures as low as 183 deg. F. below zero were covered. Tensile strength and yield point rose slowly with decreasing temperature up to 130 deg. below zero and then more rapidly. In nearly all cases the curves of the mechanical properties showed an irregularity, which occurred in different temperature ranges according to the composition. Below zero temperature the values decreased by only about 10 per cent of the room temperature value until suddenly there was a fall of about 80 per cent of the normal value. For unalloyed steels this drop occurred between minus 140 and minus 185 deg. The effect of manganese, which varied only between narrow limits, could not be observed.

The materials investigated included Armco iron, seven plain steels with carbon of 0.08 to 0.4 per cent and manganese of 0.35 to 0.8 per cent; three nickel steels of 3 to 5 per cent nickel and 0.12 per cent carbon, and a 0.71 chromium 3.77 nickel steel of 0.23 carbon. The sudden drop in value of the mechanical properties was observed in the case of the 3 per cent nickel steels at a low range, namely, between 183 and 195 deg. below zero. Against this is the fact that the 5 per cent nickel steel showed no irregularity down to minus 195 deg.

Manufacturers Supply Co., 3528 East Seventy-sixth Street, Cleveland, has been appointed distributor for the industrial products manufactured by Henry Disston & Sons, Inc., Philadelphia.



THIS WEEK ON THE

Plans Are Crystallizing For 1935 Car Production

DETROIT, Sept. 18.

AFTER weeks of uncertainty regarding the course to be taken in 1935, car manufacturers finally are molding their programs into definite shape. Revelation of plans confirms earlier impressions that volume production of new models will not get under way until late November and in some cases not until close to Jan. 1.

Ford can be cited as a specific example of what is happening with respect to 1935 cars. It has just placed an order for a large amount of equipment to be delivered to the Rouge plant to be used in the manufacture of model 48, which will identify the new V-eight as compared with the present model 40. It is understood that Ford is aiming to have this machinery built and installed within 30 days, but if such speed is realized it will be contrary to all past performances of the Ford organization.

By the time that this equipment has been put in the production line at Rouge and is ready to function as planned, it is believed that the year-end will be near at hand. Ford made a steel buy the past week, balancing short items for about 13,500 cars. Aside from this purchase, Ford is reported to have issued strict orders that no more steel is to be bought until further notice.

Ford Schedule Boosted

While the schedule at Dearborn this month is said to have been boosted somewhat, with the output likely to be around 70,000 units, October and November loom as dull months. Chief attention will be directed toward liquidation of dealers' stocks of current models. Assemblies will be limited to relatively small volume and should

fall considerably under the retail sales total.

What can be said of Ford applies to most other car makers. Pontiac will be getting started much later than anticipated. Chevrolet is counting on assembling current models, especially its standard series and trucks, through October. Its passenger car schedule has been cut about 30,000 units for the rest of the current production run. Whereas orders for passenger car parts have been cancelled, Chevrolet has given new releases of steel and parts for commercial cars and trucks.

Dodge is reported to be planning on having its new fender dies in its local plant by Oct. 25. This would seem to forecast the start of 1935 operations around the middle of November. A like situation holds true for Plymouth. Hudson hasn't made much progress toward formulation of its program for next year, according to reliable reports.

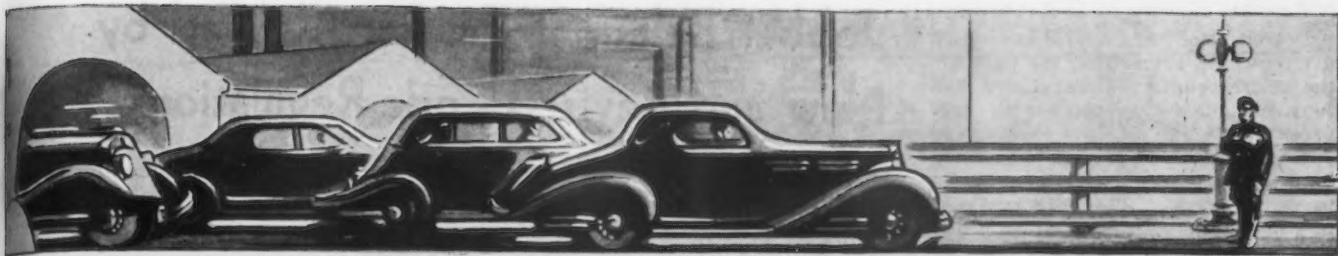
Hupmobile Reorganizing

Packard apparently is saving any departure from its traditional conservatism for its new lighter car, which will be ready sometime in January. Hupmobile, now in the midst of a reorganization of its management, probably will be delayed in new model plans by readjustments within its own ranks. Arthur Brandt, appointed assistant general manager of Hupmobile in charge of production, did the engineering work in connection with the American Austin car several years ago and also handled the engineering of equipment bought by Amtorg for the Soviet government. At one time he was head of the old Oakland Motor Car Co. Hupmobile will announce soon the appointment of a new president and general manager.

The low-price car manufacturers seem to have decided to take off the shelf the time-worn slogan, "Bigger and better," and hang it up in their dealers' establishments as the best description of their 1935 offerings. Ford is preparing a V-eight with a longer frame and wheelbase than the present car. Changes in body design are said to be sufficiently sharp to make completely new body dies essential. Briggs and Murray have been busy on these dies for a number of weeks. The new Ford, it is said, will have the motor placed farther forward. New type brakes are contemplated. It is believed that Ford will continue to make all of its passenger car frames at the Rouge plant, while truck frames will be built by Murray Corp'n. at its Ecorse factory.

Many observers are wondering how long companies in the low-price field can go along on the principle of a bigger and better car. The public has clearly demonstrated that it will balk at higher prices, yet costs of everything entering into the manufacture of a car have mounted. Perhaps the way out will be for the car maker to stress comfort, riding quality and other characteristics, meanwhile conveniently forgetting to say anything about wheelbase and bigness.

With low-price car companies still heading in the direction of larger cars, even though their pace is slackening, the opportunity for a manufacturer to step into the model T market with a low-price car designed chiefly to afford economical transportation apparently is growing. However, the industry is inclined to shy away from this market, believing in some cases that only a mirage is luring them. That is, automotive executives are convinced that American buyers don't want



ASSEMBLY LINE

midget cars or anything resembling or suggesting them. Moreover, the used car market adequately and satisfactorily furnishes good transportation to people who would naturally fall within the model T category. The depression hasn't altered the desire of Americans for bigger and better products, including motor cars, and nobody realizes this fact better than the automobile industry.

Competition Increases Within General Motors

Proceeding on the theory that competition is the life of trade, even within one's own circles, General Motors divisions are preparing to do more severe battle with each other as well as with outside manufacturers. The Pontiac six will be dropped into the General Motors line of cars just above the Chevrolet and just below the Oldsmobile six. Dual dealerships are being discontinued as rapidly as possible, although under certain conditions they will be retained permanently. However, the trend is toward exclusive dealers whose loyalty is not divided.

With the exception of Cadillac and LaSalle, General Motors cars the past year have looked pretty much alike. There are growing signs that this similarity in appearance may not be so pronounced in 1935. Even within the Chevrolet division it appears probable that the Master and the Standard series will differ in design.

Cadillac has been working on a rear-engine car, possibly for inclusion in its 1935 line of automobiles. If this car should be approved, it will supplement rather than replace the regular series. It will be largely a custom-built job. Because of Cadillac's position as the smallest volume producer in General Motors ranks and as a leader in the quality car field, it is believed that Cadillac is the logical place for General Motors to try out a rear-engine car on the public. It is understood that final decision regarding the proposed car has not been made.

Ford Buys Equipment

The equipment market is astir as various car makers round out their programs for the coming year. Ford probably is the major buyer at present,

By BURNHAM FINNEY
Detroit Editor, THE IRON AGE

much of its expenditures going for special machines designed by its own engineers. If equipment of all kinds be included, Ford now is spending more money than all other companies have so far this year. It is said to be shipping considerable machinery from Dearborn to its Dagenham, England, plant and to the Mathis plant in France, where manufacture of a V-eight car will be started shortly.

Packard is still undecided regarding further equipment purchases for its lighter car. It is considered probable that it will have its present machine tools rebuilt wherever possible; at least it is getting bids with that purpose in mind. Lincoln is getting ready for a new car, but may not have to buy many tools, since it is reported to have around 1500 machines stored at its plant. Some of the Chrysler divisions took bids recently on new equipment, but after prices were in, the management turned thumbs down on the programs. Reo is doing the engineering work on a new six-cylinder passenger car engine, which may be put into production next year. Plans are not far enough along to tell whether any equipment will be bought. Chevrolet's gear and axle plant will be purchasing some tools shortly.

The steel outlook in the automobile industry continues unsatisfactory. When Ford came into the market the past week to balance up certain sheet items, he placed a considerable part of the business with brokers, purchasing cold-rolled seconds. This action was taken because it was in a hurry for delivery and brokers' warehouses are loaded with second grades, whereas mills have virtually no tonnage on hand and rollings are irregular.

Plymouth Has Steel in Storage

When Chrysler took advantage of second quarter steel prices to buy ahead, it guessed at some of the sizes of body sheets for 1935 Plymouths. Sheets of sufficient size to be used for either current models or next year's

jobs were purchased. The result is that some of the steel for the first production run on 1935 Plymouths is in storage, thereby reducing the tonnage which will be released to mills for the fourth quarter.

From the standpoint of volume steel tonnage, the next two months can be counted out. While car operations may begin to expand the latter half of November, they will not attain impressive proportions until December or January. This means that steel releases are likely to be light until close to Nov. 15.

After a private preview to which parts makers were invited, the Leaf Spring Institute has been having its experimental car checked closely by companies whose products were installed on the car. This car was described in this column last week. It will be available in Detroit the coming week for car manufacturers to examine. Its chief features are a new independent springing system on all four wheels, using leaf springs, and a tubular wishbone steel frame. Anyone interested in seeing the car should communicate with J. H. Shoemaker, commissioner of the institute, 2250 East Grand Boulevard, Detroit.

Buick to Make No Model Changes

Buick is understood to have sent messages to its dealers to the effect that it will not make model changes for 1935, carrying through the main selling season next year with its present line. Until two years ago Buick introduced new cars in mid-summer, discontinuing this practice when the NACC asked its members to concentrate announcements around the first of the year. It is assumed that Buick now will return to its former policy and replace its present line of cars next August.

Buick Model 40, first put on the market last May, has been a success. Practically all of the company's production recently has been of this model and major effort in 1935 will be directed toward the sale of this newcomer. Early this year Buick is said to have heavily overbought materials and parts for its larger cars. The decision to continue present cars

will enable it to use up this inventory.

Detroit steel ingot operations, at 76 per cent, still are setting the pace for the entire country. Great Lakes has four out of eight open-hearth furnaces active and Ford is running at 100 per cent piling huge stocks of semi-finished steel and bars in its yards at Rouge. The only explanation of the accumulation of so much steel by Ford seems to lie in the fact that its open-hearth capacity will be inadequate to supply finishing mills when its new strip unit is completed. This mill will not be ready until next May or June, and by the time that it is supplying sheets on a steady basis the 1935 automotive production peak will have passed. This means that the steel industry will furnish a large proportion of the strip steel and sheets for next year's Ford cars.

Ford's Aggressive Policy

In the first eight months of this year Ford's world production amounted to 696,070 units. Even if its new mill had been in full operation all of this year, it is estimated that it still would have had to buy steel for 100,000 to 150,000 cars. Incidentally, Ford's output has been almost twice that of last year. Announcement that Ford is introducing a car in England to sell at \$50 less than the small English-made cars is apt to give Ford's American competitors a chill. Some of the manufacturers here are yet dazed at the aggressive merchandising shown this year by Ford as contrasted with previous policies.

Parts Releases Begun

Chrysler Corp. has given initial releases for certain parts for new models of its various divisions. Indications are that Plymouth and Dodge may be among the first cars to be offered by major companies. Chevrolet has awarded parts contracts for passenger cars for 1935, and at least in some cases, prices are lower than on contracts now expiring. Nash, which has had some die work for new models done in Detroit shops, has lowered car prices to clean up dealers' stocks of its present line prior to announcement of new jobs.

Foundry Equipment Orders Decline

THE index number of net orders for foundry equipment during August was 43.1 as compared with 50.7 in July and 56.28 in August last year, according to reports of 21 members of the Foundry Equipment Manufacturers Association. Shipments during August were 48.7 as compared with 67.2 in July. Unfilled orders declined in August to 36.3 from 43.1 in July.

Jobber Relations Further Clarified by New and Revised Code Regulations

SALES of iron and steel products to jobbers are further clarified by the amending of code regulations No. 1, effective Sept. 20, and by the approval by the directors of the American Iron and Steel Institute of Regulations 7 and 8, to become effective on the same date. The present commercial resolutions covering deductions from base prices of products sold for identified construction projects, and allowances on sales in intrastate commerce in States having a sales tax have also been amended.

The revised regulations No. 1 now cover sales to jobbers of all products not treated in other regulations which require the signing of separate jobbers' agreements. The most important change from the old regulations is in the definition of a jobber. The words, "represents that he will," or some variation thereof, have been inserted throughout the definition, evidently to protect mills who have acted in good faith in signing agreements with jobbers who failed to carry out the intentions manifested when agreements were signed. The selling company, however, is not released from the obligation of making reasonable investigation of the status of any firm seeking a jobber's agreement.

The definition also restricts the sales of jobbers to purchasers in whom they do not have a financial interest, and further defines retail dealers as "those having established places of business and regularly owning and maintaining sufficient stocks to enable them respectively to meet the ordinary demands upon them and who purchase for resale to consumers."

The revised regulations do not affect jobber agreements now applying, but forbid deductions to jobbers under such agreements after Oct. 31, 1934. This will require the signing of new jobbers' agreements prior to Nov. 1.

Separate Agreements for Pipe, Stainless and Tool Steel

Separate jobbers' agreements are now required on sales to distributors of merchant wire products, of galvanized sheets and roofing, and of concrete reinforcing bars. Regulations No. 7, to become effective Sept. 20, provide for the signing of similar agreements in making sales to jobbers of standard pipe, line pipe, oil country tubular products, mechanical tubing and boiler tubes. Regulations No. 8, effective on the same date, cover agreements with jobbers of stainless steel and tool steel.

Commercial resolution No. A5 was amended by the directors of the in-

stitute on Sept. 13, to become effective Sept. 20, in order to conform with the provision in the code which forbids price advances except at the beginning of calendar quarters. The amended resolution provides that price protection on products sold for an identified construction project may now be extended for 60 days after the beginning of the next calendar quarter after the protection was originally granted, instead of for 60 days after the original agreement was made, as heretofore.

Kentucky Sales Tax Recognized

Deductions from the base prices of steel products sold in intrastate commerce in Kentucky to the amount of the State sales tax are permitted by amended resolution A7, effective Sept. 20. Similar deductions are already provided for on products sold in intrastate commerce in California and North Carolina, but provision is no longer made in the case of Oregon.

Steel Beer Barrel Makers Plan Campaign

A SOUND motion picture entitled "Science Marches On," has just been completed for the Associated Manufacturers of Steel Beer Barrels. In the introduction of the picture, a series of pictures of old and new conditions show many instances in which, under modern development, wood has been replaced by steel.

The picture is to be shown to breweries, beer barrel distributors, and beer dispensers throughout the United States. The meetings at which the picture is to be shown are being arranged at the places of business of distributors, with invitations issued to various dispensers in each distributor's territory. Many manufacturers of steel products are watching the progress of the campaign with great interest.

Udylite Process Co., Detroit, has changed corporate name to Udylite Co., and removed its general offices and laboratories to 1651 Grand Boulevard. The company is engaged in the sale of electroplating supplies and equipment, in addition to its process of cadmium plating.

Tube-Turns, Inc., Louisville, Ky., has removed office in New York from 30 Church Street to 110 East Forty-second Street. W. P. Curley is district manager.

Latrobe Electric Steel Co., Latrobe, Pa., has opened tool steel warehouse at 380 East Main Street, Stratford, Conn., which will be in charge of George H. Grundy and Charles A. Lampard.

Government-Financed Work Is Main Reliance of Steel Trade

Large Tonnages About to Come Up For Bids as Demand From Other Sources Lags—Scrap Declines Further

MISCELLANEOUS orders for both steel and pig iron have increased moderately, but they reflect a growth of replacement purchases rather than the initiation of a broad fall upturn. In at least two important market centers finished steel bookings thus far this month remain smaller than for the corresponding period last month, and where there is a margin over August it is not of impressive proportions. So cautious are buyers in placing business that orders for truckloads are being placed where carload orders would be ordinarily expected. The necessity of waiting for bookings of this type to accumulate has accentuated the irregularity of mill operations.

In the absence of a seasonal upswing in buying, Government-financed construction work, doubtless expedited because of the current business setback, looms larger as a sustaining force in the market. Bids go in next week on 15,000 tons of reinforcing bars for the Fort Peck dam. On Oct. 2, figures will be taken on a Government office building and post office in New York requiring 17,000 tons of structural steel. Two units of the Colorado River aqueduct, one of which will come up for tenders Oct. 11 and the other shortly thereafter, call for upward of 80,000 tons of steel. Bridge, wharf and tunnel improvements in the Pittsburgh district, just authorized and scheduled to go ahead by Dec. 1, will take 50,000 tons. In addition, the initial purchase of 25,000 tons of wire fencing for the Great Plains shelter belt is due in October. These major tonnages, supplemented by numerous smaller ones, form an imposing total.

Fabricated structural steel awards of the past week, at 17,650 tons, are almost double those of the previous week. The outstanding letting, 5235 tons, was for a private project, the Fisher-Chevrolet assembly plant at Baltimore. Plate awards total 1500 tons.

RAIL production has virtually ceased in the North, but the Alabama mill will start up next week on 2000 tons for a Southern Railway subsidiary. The Pennsylvania and the Norfolk & Western will take Clayton Act bids Sept. 26 on their fourth quarter steel requirements, amounting to 5000 tons and 4500 tons respectively. No broad revival of railroad buying is looked for unless a new program of Government-financed work is launched under pressure from the Administration.

Automobile company purchases of steel have been limited to additional fill-in orders for current models. Ford has bought steel to balance short items for 13,500 cars, while Chevrolet has issued releases of steel

and parts for commercial cars and trucks, although canceling orders for passenger car parts. Purchases of automobile steel are not likely to develop in real volume for another month or two. Production of automobile bodies is being impeded by non-delivery of upholstering material because of the textile strike.

TIN PLATE business continues to show contra-seasonal buoyancy, both because of export orders and Government meat packing activities. Tin mill operations have risen from 40 to 45 per cent of capacity. The reaffirmation of the present domestic tin plate price for fourth quarter is of little moment, since the next large buying movement will be for 1935, and it will not get under way until prices for next year are announced. And there is not likely to be much anticipatory rolling of 1935 tin plate, since large users are in a waiting mood, sensing the possibility of a price change to their advantage.

The same spirit of expectancy is evident among buyers in general, and they have been encouraged in this attitude by recent price developments. Bolts and nuts, which are not under the steel code, have been reduced about 15 per cent. Scrap, notwithstanding an expanding export demand, has declined from \$9.67 to \$9.58 a ton, a new low for the year. A Detroit producer of cold-rolled strip has filed a price of 2.35c. a lb., a reduction of \$5 a ton from the previous minimum quotation.

WHILE prices of most products have been reaffirmed without change for the fourth quarter, such action has no significance under the code except as a guarantee against advances. Reductions can be filed at any time. Whether or not the waiting attitude of the trade is justified, it must be conceded that the weakness in cold-rolled strip stands by itself. For some time strip mills have suffered because users discovered that they could economize by buying wide cold-finished sheets and slitting them.

Steel ingot production has risen one and one-half points to 21 per cent of capacity. Detroit continues to lead the country with an unchanged rate of 76 per cent. Operations have risen two points to 13 per cent at Pittsburgh, two points to 25 per cent in the Valleys, six points to 21 per cent at Cleveland and five points to 24 per cent at Buffalo. The Chicago rate is off two points to 22 per cent, and production at other centers is substantially unchanged.

THE IRON AGE composite prices for finished steel and pig iron are unchanged at 2.124c. a lb. and \$17.90 a ton.

▲ ▲ ▲ A Comparison of Prices ▲ ▲ ▲

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:

	Sept. 18, 1934	Sept. 11, 1934	Aug. 21, 1934	Sept. 19, 1933
No. 2 fdy., Philadelphia.....	\$20.26	\$20.26	\$20.26	\$18.34
No. 2, Valley furnace.....	18.50	18.50	18.50	17.50
No. 2 Southern, Cin'ti.....	19.13	19.13	19.13	18.23
No. 2, Birmingham†.....	14.50	14.50	14.50	13.50
No. 2 foundry, Chicago*.....	18.50	18.50	18.50	17.50
Basic, del'd eastern Pa.....	19.76	19.76	19.76	17.84
Basic, Valley furnace.....	18.00	18.00	18.00	17.00
Valley Bessemer, del'd P'gh.....	20.76	20.76	20.76	19.89
Malleable, Chicago*.....	18.50	18.50	18.50	17.50
Malleable, Valley.....	18.50	18.50	18.50	17.50
L. S. charcoal, Chicago.....	24.04	24.04	24.04	23.67
Ferromanganese, seab'd carlots.....	85.00	85.00	85.00	82.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:

	Sept. 18, 1934	Sept. 11, 1934	Aug. 21, 1934	Sept. 19, 1933
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$40.00
Light rails, Pittsburgh.....	35.00	35.00	35.00	32.00
Rerolling billets, Pittsburgh.....	27.00	27.00	27.00	26.00
Sheet bars, Pittsburgh.....	28.00	28.00	28.00	26.00
Slabs, Pittsburgh.....	27.00	27.00	27.00	26.00
Forging billets, Pittsburgh.....	32.00	32.00	32.00	31.00
Wire rods, Pittsburgh.....	38.00	38.00	38.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	1.70	1.70	1.70	1.60

Finished Steel

Per Lb.:

	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.80	1.80	1.80	1.60
Bars, Chicago.....	1.85	1.85	1.85	1.65
Bars, Cleveland.....	1.85	1.85	1.85	1.65
Bars, New York.....	2.13	2.13	2.13	1.95
Plates, Pittsburgh.....	1.80	1.80	1.80	1.60
Plates, Chicago.....	1.85	1.85	1.85	1.65
Plates, New York.....	2.08	2.08	2.08	1.898
Structural shapes, Pittsburgh.....	1.80	1.80	1.80	1.60
Structural shapes, Chicago.....	1.85	1.85	1.85	1.65
Structural shapes, New York.....	2.05 1/4	2.05 1/4	2.05 1/4	1.86775
Cold-finished bars, Pittsburgh.....	2.10	2.10	2.10	1.95
Hot-rolled strips, Pittsburgh.....	1.85	1.85	1.85	1.65
Cold-rolled strips, Pittsburgh.....	2.60	2.60	2.60	2.25

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. †Blue Eagle copper.

Finished Steel

Per Lb.:

	Sept. 18, 1934	Sept. 11, 1934	Aug. 21, 1934	Sept. 19, 1933
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.40	2.40	2.40	2.25
Hot-rolled annealed sheets, No. 24, Gary.....	2.50	2.50	2.50	2.35
Sheets, galv., No. 24, P'gh....	3.10	3.10	3.10	2.85
Sheets, galv., No. 24, Gary....	3.20	3.20	3.20	2.95
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.65
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.75
Wire nails, Pittsburgh.....	2.60	2.60	2.60	2.10
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.15
Plain wire, Pittsburgh.....	2.30	2.30	2.30	2.10
Plain wire, Chicago dist. mill..	2.35	2.35	2.35	2.15
Barbed wire, galv., P'gh.....	3.00	3.00	3.00	2.60
Barbed wire, galv., Chicago dist. mill.....	3.05	3.05	3.05	2.65
Tin plate, 100 lb. box, P'gh....	\$5.25	\$5.25	\$5.25	\$4.65

Scrap

Per Gross Ton:

	Sept. 18, 1934	Sept. 11, 1934	Aug. 21, 1934	Sept. 19, 1933
Heavy melting steel, P'gh....	\$10.75	\$10.75	\$11.25	\$12.75
Heavy melting steel, Phila....	9.50	9.75	10.00	11.00
Heavy melting steel, Ch'go....	8.50	8.50	9.25	9.75
Carwheels, Chicago.....	9.50	9.50	9.50	10.00
Carwheels, Philadelphia.....	11.25	11.25	11.25	12.75
No. 1 cast, Pittsburgh.....	11.75	11.75	11.75	11.75
No. 1 cast, Philadelphia.....	11.75	11.75	11.75	12.50
No. 1 cast, Ch'go (net ton)....	8.00	8.00	8.00	10.00
No. 1 RR. wrot., Phila.....	11.25	11.25	11.25	12.00
No. 1 RR. wrot., Ch'go (net) ..	6.75	6.75	7.25	8.50

Coke, Connellsville

Per Net Ton at Oven:

	Sept. 18, 1934	Sept. 11, 1934	Aug. 21, 1934	Sept. 19, 1933
Furnace coke, prompt.....	\$3.85	\$3.85	\$3.85	\$2.50
Foundry coke, prompt.....	4.60	4.60	4.60	3.25

Metals

Per Lb. to Large Buyers:

	Cents	Cents	Cents	Cents
Electrolytic copper, refinery†.	8.75	8.75	8.75	8.75
Lake copper, New York†.....	9.12 1/2	9.12 1/2	9.12 1/2	9.00
Tin (Straits), New York.....	51.37 1/2	51.37 1/2	52.10	47.95
Zinc, East St. Louis.....	4.00	4.15	4.30	4.75
Zinc, New York.....	4.35	4.50	4.65	5.12
Lead, St. Louis.....	3.55	3.55	3.60	4.35
Lead, New York.....	3.70	3.70	3.75	4.50
Antimony (Asiatic), N. Y....	8.75	8.62 1/2	8.62 1/2	6.75

▲ ▲ ▲ The Iron Age Composite Prices ▲ ▲ ▲

Finished Steel

Sept. 18, 1934
One week ago
One month ago
One year ago

2.124c. a Lb.
2.124c.
2.124c.
1.959c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

	HIGH	LOW
1934	2.199c., April 24;	2.008c., Jan. 2
1933	2.015c., Oct. 3;	1.867c., April 18
1932	1.977c., Oct. 4;	1.926c., Feb. 2
1931	2.037c., Jan. 13;	1.945c., Dec. 29
1930	2.273c., Jan. 7;	2.018c., Dec. 9
1929	2.317c., April 2;	2.273c., Oct. 29
1928	2.286c., Dec. 11;	2.217c., July 17
1927	2.402c., Jan. 4;	2.212c., Nov. 1

Pig Iron

\$17.90 a Gross Ton
17.90
17.90
16.71

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
17.90, May 1;	16.90, Dec. 5;	16.90, Jan. 27
14.81, Jan. 5;	15.90, Jan. 6;	13.56, Jan. 3
18.21, Jan. 7;	14.79, Dec. 15	13.56, Dec. 6
18.71, May 14;	15.90, Dec. 16	14.79, Dec. 15
18.59, Nov. 27;	18.21, Dec. 17	15.90, Dec. 16
19.71, Jan. 4;	17.04, July 24	18.21, Dec. 17
	17.54, Nov. 1	17.04, July 24

Steel Scrap

\$9.58 a Gross Ton
9.67
10.17
11.17

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
\$13.00, Mar. 13;	12.25, Aug. 8;	\$9.58, Sept. 18
8.50, Jan. 12;	11.33, Jan. 6;	6.75, Jan. 3
15.00, Feb. 18;	11.25, Dec. 29	8.50, Dec. 29
17.58, Jan. 29;	14.08, Dec. 3	11.25, Dec. 29
16.50, Dec. 31;	13.08, July 2	14.08, Dec. 3
15.25, Jan. 11;	13.08, Nov. 22	13.08, July 2

Further Gain in Production In Pittsburgh and Valleys



Slight Increase Is Attributed to Replacement Buying — Pittsburgh Projects to Take 50,000 Tons of Steel

PITTSBURGH, Sept. 18.—For the second consecutive weekly period steel output in the Pittsburgh district has risen, now averaging 13 per cent, a two-point increase over the previous week. Production in the Valleys and nearby northern Ohio mills scored a like gain to 25 per cent. Output in the Wheeling district is steady at 21 per cent.

The slight increases in the Pittsburgh and Valley districts reflect at least a modicum of improvement in daily orders for finished steel products. At the same time steel producers here are not yet ready to interpret the betterment as forerunner of a broad fall buying movement but are rather inclined to regard it as an indication that replacement buying has begun in a small way.

Sheet sellers are encouraged by the appearance of the first significant business in many weeks from the motor car makers. Strip steel, bar and cold-finished steel mills still are suffering from a lack of automotive tonnage.

Of greatest cheer to the local steel industry is the announcement yesterday of the approval by the local government of Federal provisions covering a loan of \$19,000,000 and a direct grant of \$5,165,000. These funds, which will be administered by the Allegheny County authority, will be expended for the erection of the Homestead-Pittsburgh bridge and for the Glenwood bridge over the Monongahela River; replacing the Highland Park-Sharpsburg bridge over the Allegheny River; the Jerome Street improvement and bridge over the Youghiogheny River at McKeesport; Fort Duquesne tunnels and improvement of downtown Pittsburgh wharves. About 40,000 to 50,000 tons of bars, shapes, plates, piling and reinforcing steel is estimated to be required for these projects. Work is to be begun about Dec. 1, and it seems almost certain that the lion's share of steel requirements will be placed with Pittsburgh district mills.

Discounts on bolts and nuts have been revised, resulting in an estimated drop of \$15 a ton.

Scrap

Trading in the past week was virtually at a standstill. Weakness has

developed in machine shop turnings and short shoveling steel turnings, which are down 25c. Blast furnace grades are also soft at 50c. a ton below previous quotations. Suspension of shipments to an independent mill has been lifted, but the movement to most other destinations is extremely sluggish, in step with low mill operations. There is very little evidence, however, of selling pressure on the part of brokers, and the major grades are showing some resistance to further weakness.

Pig Iron

Foundry melt in this district, though slightly larger than earlier in the quarter, has not expanded sufficiently to boost furnace bookings in September. Producers also are not finding any support from the large users of steel-making grades. With practically all pig iron business from roll makers handled on a reciprocal basis, demand from that source is not contributing to open market activity.

Semi-Finished Steel

Supported chiefly by demand from detached tin plate mills, sheet bars continue fairly active. Interest from the finished sheet mills, however, remains depressed, and the aggregate movement of sheet bars is still far below normal. Wire rods are particularly dull, with the movement to bolt makers thus far in the third quarter in negligible volume. Shipments of skelp are somewhat sporadic.

Bolts, Nuts and Rivets

On Sept. 17 all important producers revised discounts on machine carriage, lag and plow bolts, and hot pressed, cold pressed and semi-finished nuts from 70 per cent off list to 70, 10 and 10 per cent. The revision represents an estimated reduction of nearly \$15 a ton from the previously ruling prices. The new quotations will apply to all business for delivery during the remainder of the year. Releases against third quarter contracts have been very limited, and the weakness in prices is believed to have developed from efforts to induce sales at price concessions. The Navy is inquiring for a tonnage of bolts and nuts. Large and small rivets are unchanged.

Rails and Track Accessories

Bids are being taken by several carriers on fourth quarter requirements of steel. Otherwise the market is lifeless and depends entirely upon spot orders, usually for imperative maintenance work.

Bars

Producers report no marked change in bookings for the first half of September in comparison with orders for the same period in August. Releases against third quarter contracts are still coming in very slowly, while spot orders generally request immediate shipment. The erratic influx of tonnage, particularly orders labeled for rush delivery, is having its effect on bar mill operations, which are not predictable from week to week. Railroads are entering the market for their nominal requirements of bars for fourth quarter.

Reinforcing Steel

State road work is accounting for a fair share of new reinforcing steel tonnage. Fresh specifications, however, are usually for minor lots, and interest in this market is generally concentrated on the prospective letting of 15,000 tons next week for the Fort Peck, Mont., dam.

Cold-Finished Steel Bars

Further expansion in demand is lacking, although specifications in the past week held the gain of the preceding week. Although further improvement is expected next month, it is difficult at the moment to place a finger on any definite augural factors. The Pittsburgh base price of 2.10c. is very steady.

Plates and Shapes

The United States Engineer Office at St. Louis is taking bids until Sept. 21 on ten small pontoons and 60 sections of pipe, requiring a total of about 300 tons of plates and shapes. In the Pittsburgh district projected barge construction is very scant, and new tank work and railroad equipment construction are likewise limited. Other plate inquiries are for unimportant quantities. The structural market is at present featured by the taking of bids at Washington on the Federal court house and post office at New York, which will require about 17,000 tons. Fresh structural projects are featureless.

Wire Products

Activity in this market continues to be abnormally slow. Mill operations, on a whole, show little change, with the general average at 15 to 20 per cent. The cotton belt continues to lead in demand for agricultural items. Industrial buying has not improved.

Tubular Products

Heavy stocks of oil country goods purchased in second quarter are believed generally to have been worked off, and expectations of an improved

demand from the oil fields in October are growing. A slight seasonal improvement is noticeable in demand for stationary pipe for heating purposes. Otherwise the tubular market shows little change. Specifications for drain pipe for the Fort Peck, Mont., dam spillway revealed a total requirement of 14 tons of steel pipe, with tile pipe predominating. The Pennsylvania Railroad has requested prices on boiler tubes in conjunction with its usual quarterly bids for fourth quarter.

Sheets

The first significant automotive tonnage in many weeks appeared last week. Although from a tonnage standpoint the business was not large, sellers are now inclined to expect a more regular flow of automotive orders, which have been lagging for the past two months. Miscellaneous specifications, though not improved, are holding their own. Sheet mill operations this week will average around 20 per cent.

Tin Plate

Several large producers last week were able to increase operations to about 45 per cent, thereby bettering original schedules for the week of 40 per cent. The impetus for the increase was provided by substantial export and Government meat packing activities. In the current week revisions at some mills have been offset by increases at other units, and the 45 per cent average is expected to hold through the week. Prospects for sustained export business are considered good. If foreign business continues at its recent rate, producers will not be faced with the usual sharp seasonal fluctuations in operations. General specifications from domestic consumers are declining, and will undoubtedly exert greater influence upon mill activity in the next two months.

Strip Steel

A shade of improvement is discernible in orders for hot-rolled and cold-rolled strip. The general character of buying, however, is very spoty and the absence of tonnage from automobile and parts makers is particularly damaging to mill schedules. Most mills at best are averaging about 20 to 22 per cent.

Coke and Coal

Export inquiries have brought some color to this market, which otherwise is very drab. The position of the dollar in international exchange is apparently inviting the appearance of some foreign consumers in the American market. In this district bona fide inquiries for cargo lots of coke have strengthened the possibilities of a fair movement for shipment abroad. Domestically, demand for both coke and coal is dragging bottom. Cooler weather has stimulated domestic-size fuels, but industrial sizes are difficult to move.

Coast Project to Take 79,000 Tons of Steel

SAN FRANCISCO, Sept. 17.—The opening of bids on the 110-mile section of the Colorado River aqueduct has been advanced to Oct. 11. Under Specification No. 70 approximately 6000 tons of plates, 38,000 tons of rail and reinforcing bars and 400 tons of structural steel will be required. A second unit of the project, for which specifications are to be issued shortly, calls for approximately 29,900 tons of bars, 3900 tons of plates and 1200 tons of structural steel. Wide attention has been drawn to the project because of the major tonnages involved.

Greater activity has been noted in southern California both in the number of new projects and in the tonnage requirements. Awards of 280 tons of reinforcing bars for two schools went to Concrete Engineering Co. and Soule Steel Co. Golden Gate Iron Works booked 150 tons of structural steel for a utilities building at Yosemite, Cal.

New jobs listed during the week were limited in number and tonnage. Although bids have been called for on 18 post offices, total steel requirements amount to only 817 tons of reinforcing bars and 583 tons of structural steel. Industrial purchases, while greater in number, have ranged from 40 to 80 tons. Little improvement has been reported in mill production.

Detroit Scrap Market Awaits Price Decline

DETROIT, Sept. 18.—Local district steel mills are endeavoring to purchase scrap at 50c. to 75c. a ton under recent quotations but thus far dealers are refusing to sell on that basis. It is probable, however, that in the absence of buying from other sources prices will decline in the next week.

Larger Exports of Scrap From New England

BOSTON, Sept. 18.—Local scrap exporters are again active, soliciting tonnages of No. 1 and No. 2 steel for nearby loading. The J. Lipsitz Iron Co., Chelsea, Mass., has purchased a sizable tonnage of trackage in Malden, Mass., and will apply it to a Japanese order. This week 2000 tons will be loaded at Providence, R. I., for Poland. The steamer will take an additional tonnage at New York. The Weirton Steel Co. is obtaining carlots of steel turnings at \$1 a ton on cars shipping point, and another Pennsyl-

vania consumer is taking similar lots of bundled skeleton at \$3.30 a ton, f.o.b. The American Steel & Wire Co., Worcester, Mass., also is taking in an occasional car of skeleton, as well as No. 1 steel.

A few hundred tons of pig iron, mostly imported and from Alabama, has been sold, but generally speaking the market is still dull, with little prospect of improving this month. Carlot sales are the exception, most consumers buying in truck lots. The closing of the Gilbert & Barker Mfg. Co., Springfield, Mass., foundry, throwing 350 out of employment, emphasizes the slack condition of the foundry industry in general.

Stress Cracks in Ball Bearing Steel

ON forging a ball-bearing steel, of 1.1 per cent carbon and 1.6 per cent chromium, at temperatures above 1130 deg. C., tiny fissures observed were explained as follows by W. Tschernischoff in *Stahl und Eisen*, July 5. After ordinary forging and air-cooling, this steel has a pearlitic structure with a network of hypereutectoid carbide; repeated heating to over 1100 deg. causes no change. If the temperature exceeds 1150, the melting point of the eutectic in chromium steel, the carbides dissolve, giving rise to zones enriched in carbon and chromium, which on air-cooling produce a martensitic structure. The number of these islands increases with the progressive solution of the carbides. After slow cooling (100 deg. per hr.), coarse carbides were found in these martensite patches, while the neighboring metal was impoverished in carbides. Martensite formation is connected with a volume change, which sets up stresses; if the latter equal the residual forging stresses, cracks are formed.

August Structural Steel Shipments Up

AUGUST bookings of structural steel for fabrication, according to preliminary reports received by the American Institute of Steel Construction, were approximately 20 per cent larger than for the previous month, but at least 10 per cent below the average monthly bookings of the first half of this year and 12 per cent below the bookings of August, 1933, last year.

August shipments ran far ahead of previous months and ahead of August last year. The tonnage available for future fabrication therefore has shown a decline over recent months but is still 5 per cent larger than at this time last year.

Structural Steel Only Active Line in Chicago District



Steel Ingot Output Drops Two Points to 22 Per Cent—Cold Rolled Strip Prices Disturbed—Scrap Is Easier

CHICAGO, Sept. 18.—A moderate improvement in specifications for finished steel would be more impressive were it not due almost wholly to releases for structural steel, the bulk of which are for projects for which the Government is furnishing the money. The bar market, quite frequently a good indicator of a turn in business, is quiet, and demand for wire products is unusually slow for this season of the year.

Ingot output has dropped two points to 22 per cent of capacity. The scrap market is easier and only cast grades are showing life. Boat movements from Chicago to Lake Erie are at a standstill and dealers are of the opinion that dock accumulations will not be disturbed this fall. Inquiries for scrap to be shipped abroad are numerous.

Prices of finished steel are stable with the exception of cold-rolled strip when sold in the territory immediately to the east of Chicago.

A survey of the agricultural implement trade discloses that the fall demand for machinery is below expectations, though some improvement is noted.

On the whole, the trade is worried over the lack of snap in all lines, which is a reflection of the waiting attitude now being taken by most consumers.

Pig Iron

Shipments of Northern foundry iron show a gain of about 10 per cent over the first half of August. Sales, though heavier, are very small for this time of year. Two merchant furnaces are making more iron than consumers are taking.

Cast Iron Pipe

The past week turned more active and orders have been fairly numerous. Private business placed includes 300 tons of 42-in. pipe for a chemical plant and about 60 tons of 14-in. for a Western railroad. James B. Clow & Sons have taken 225 tons for Grayling, Mich., and 400 tons for Seymour, Wis. The park board of Kenosha, Wis., Chilton, Wis., and Burlington, Iowa, have all entered small orders. New projects are taking shape

and pipe sellers look for fair activity in the early fall. Prices are steady.

Reinforcing Bars

Dealers display less certainty as to the volume of business they will do this fall. New projects, though fairly numerous, are all for small tonnages and only small jobs are now passing through estimators' hands. Illinois road slab contracts give contractors the option of using either the old or new type expansion joint. The new type, which is specified by some contractors, eliminates 85 per cent of the bars formerly used. It is too early to gage the effect of this move on the bar tonnages that will hereafter go into Illinois road work. All eyes are turned on the Fort Peck, Mont., dam. Bids will be opened Sept. 24 on 18,000 tons of bars to be used in that project.

Cold-Rolled Strips

This market remains very dull not only because of low demand but because some users are putting in slitters and buying cold-rolled sheet sizes which they then trim to their needs. There is some price disturbance east of Chicago, but quotations in the local market remain steady.

Sheets

Consumers' needs are extremely spotty, and hot mill operations range between 15 and 20 per cent of capacity. However, sellers find inquiries more active and they are inclined to believe that the bottom of demand is here and that a turn for the better is near at hand.

Rails

Both Chicago district rail mills are down and there is nothing in sight that will bring them into active service again. Track accessory orders dribble in, but the aggregate tonnage is small. The approach of cold weather is bringing some life to light rails, orders for a few carloads having recently been placed.

Bars

Both sales and specifications remain dull, though there is some quickening noticeable in the matter of inquiries. Farm implement manufacturers have plans but they are slow in putting

them into execution, which lends weight to the belief that fall buying of farm equipment has not developed as fast as the manufacturers had hoped. However, in all probability winter manufacturing schedules will be heavier than a year ago because of expectations that Government money and higher prices for crops will bring the farmer into the market in a substantial way next spring. One bar mill near Chicago has worked out its books and expects to close down at the end of the week.

Wire Products

Sellers are apprehensive as to what the future holds for them. They are now almost a month past the time when the fall trade should make itself felt and so far there is not so much as a whisper that heavier demand is on the way. Manufacturing consumers are biding their time and show extreme caution even when placing small fill-in orders. Contracts are very scarce. Better demand for nails, which had been expected to follow activities of the HOLC, has not yet been felt at mills. Production still drags at 20 to 25 per cent of capacity.

Plates

This market looks brighter on the basis of several sizable awards and a number of attractive inquiries. The Metropolitan Water District, Los Angeles, Cal., will require 6000 tons for siphons. Orders have been placed for about 700 tons for the Pine View development in Utah and a fabricator in Chicago will make over 600 tons of pipe for delivery to Ponca City, Okla. Item quantity extras on plates and shapes for lots ranging from 999 to 5999 lb. have been suspended until Dec. 1.

Structural Material

This commodity is contributing the only real life now being shown in the steel market and it also is responsible for a gain in specifications as compared with a week ago. Awards total 4500 tons, in which are included about 800 tons of private work. Fresh inquiries total 5200 tons, including almost 1200 tons for private jobs.

Scrap

Except for some transactions in cast grades the scrap market continues dull and weak. Dealers find ample supplies of heavy melting steel at \$8 to \$8.25 and mills are offering to take this grade at \$8.50 a gross ton delivered. A Southern dealer is reported to have taken the 75,000 tons of scrap that represents the 5000 rolling stock units to be scrapped by the Southern Railway. There is brisk inquiry for scrap to be shipped to seaboard and to Canada, but prices offered are out of line with the Chicago market. These inquiries are coming from the principal consuming countries of the world.

Moderate Gain in Steel Bookings at New York



Tin Plate Price Reaffirmed — Effective Date of Quantity Extras on Plates and Shapes Postponed—Baltimore Structural Job Placed

NEW YORK, Sept. 18.—Demand for finished steel is still light, although some improvement in bookings is to be noted in the case of tin plate, pipe and reinforcing mesh. Recent success in marketing railroad securities held by the PWA is expected to make additional Federal funds available this fall for further loans to carriers for the purchase of rails and equipment. The Lehigh Valley which, according to a PWA announcement, obtained funds for the construction of 1900 freight cars in its own shops, will repair 1500 freight cars and buy 400 70-ton gondola cars instead. The Pennsylvania Railroad has increased the maximum quantity of electric locomotives on its current inquiry from 50 to 58 and may purchase two different types of engines.

Structural steel business is featured by awards of 5235 tons for a Chevrolet assembly plant at Baltimore to the Jones & Laughlin Steel Corp., and 1125 tons for a surgical operating building at Boston to the New England Structural Co.

The domestic tin plate price has been reaffirmed for the fourth quarter. Otherwise the price situation is unchanged except for a report that a Detroit maker of cold-rolled strip has filed a quotation of 2.35c., Pittsburgh, or \$5 a ton below the present market.

In view of numerous complaints on the part of consumers, the effective date of the new quantity extras on plates and shapes has been postponed from Oct. 1 to Jan. 1, 1935. This will give buyers an opportunity to air their objections. Consumer acquiescence to the steel code is by no means all that could be desired. One example of recalcitrance is the refusal of some purchasers to pay interest on overdue accounts. The announcement that the NRA proposes to police codes supplementary to the steel code is, therefore, of particular interest. Some of these allied groups have not yet accepted codes, this being notably true of the structural industry. In the case of the ornamental iron fabricators, however, the NRA has appointed an administrator to function until the industry itself selects a code authority.

Pig Iron

Several sellers report an increase in spot sales, indicating that foundry stocks accumulated at the end of the second quarter are finally being used up. Scarcely any forward buying is reported and sales of approximately 2000 tons in the last seven days include little or no fourth quarter iron. In the previous week 4100 tons were sold, as compared with only 800 tons in the preceding seven-day period. Credit conditions in the foundry industry are still rather unsatisfactory

Gold Mining Is Main Support of Canadian Mills

TORONTO, ONT., Sept. 18.—While some large tonnage contracts are expected to be placed soon by the Canadian National and Canadian Pacific railroads, the bulk of new business in iron and steel, at the present time, is being supplied by the mining industry. In some quarters it is estimated that there will be 100 new gold producers added to the Canadian list before the end of next year. At present a large number of companies have reached the development stage where mills are justified, and each week brings a report from some company regarding mill plans. In addition, there is a big demand for general tools, equipment and mining plant in practically all fields of the country.

The automotive industry is on a curtailed operating basis, but is expected to revive later in the year. Building trades are dull with comparatively little business from this source.

Pig iron melters continue to take supplies on a hand-to-mouth basis, with the result that the bulk of new orders are in single car lots, with weekly awards around 500 tons. Local blast furnace representatives look for a minor revival in sales later in the year. Foundry operations average about 35 per cent of capacity, and melt by steel mills is somewhat higher. The present policy of melters is to hold inventories at a minimum, pending further improvement in business

and sellers are finding out that reorganizations under the Federal Bankruptcy Act leave them without recourse to make collections for as long as five years.

Reinforcing Steel

Road mesh is still fairly active with approximately 1000 tons placed last week in New York State alone. New reinforcing bar projects are not numerous in this immediate territory, but New York contractors are figuring on some of the large dam projects in the West which will take enormous bar tonnages. Joseph T. Ryerson & Son, Inc., has booked 250 tons of bars for a transportation inspection shed in Jamaica, N. Y.

Scrap

Domestic business is still lacking, but export demand is well sustained at recent prices. Prices on cast scrap to local foundries are slightly lower, and heavy breakable cast is being bought for eastern Pennsylvania consumption at as low as \$6 a ton. Recent export demand for steel car axles forced the price up as high as \$15.90 a ton, but the principal local user is still paying only \$12.

as a whole. Pig iron production is holding between 36,000 and 40,000 tons per month with three furnaces blowing, located as follows: Canadian Furnace Co., Port Colborne, one; Steel Co. of Canada, Ltd., Hamilton, Ont., one, and Dominion Steel & Coal Co., Sydney, N. S., one. The bulk of output is basic iron for further use of producing companies.

Trading in iron and steel scrap has fallen into a state bordering on stagnation, with only a few special grades moving. Dealers have made no revision in price lists but are taking supplies mostly at quoted levels, although when desirable lots of cast scrap are offered some bidding appears. Published prices strike a good average of what is being offered.

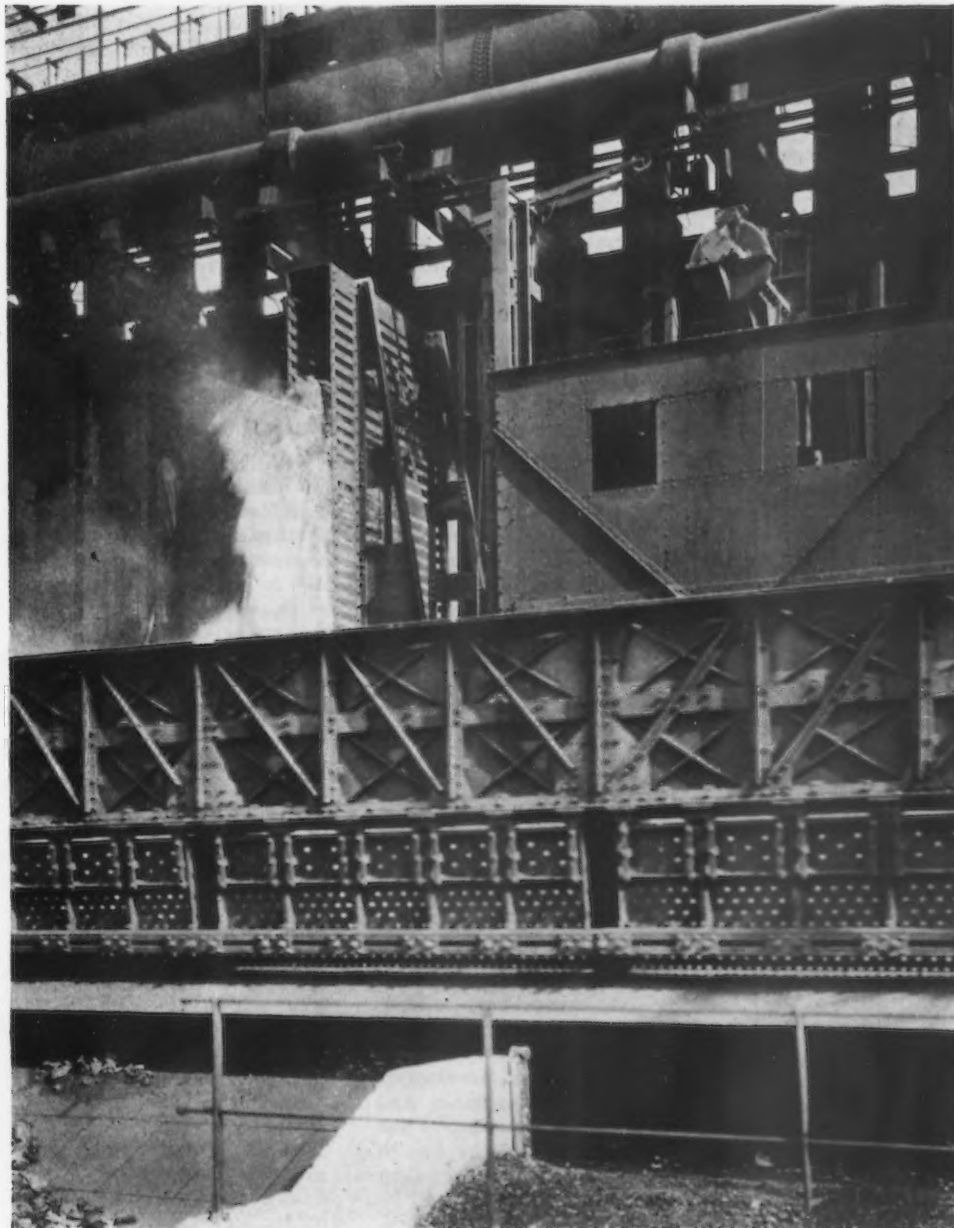
Rail and Pipe Tonnages Feature Southern Mart

BIRMINGHAM, Sept. 18.—The outlook for pig iron is bleak, but in the case of steel a better demand from the country trade is in prospect. Pig iron buying still consists of small, spot orders. Shipments this month may exceed by a slight margin those of August, but total movement will not be large. Fourth quarter bookings lag, about the only forward buying consisting of a few scattered commitments for limited amounts from small foundries.

The Tennessee, Coal, Iron & Railroad Co. has booked 2000 tons of 130-

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KOPPERS BUILDING

PITTSBURGH, PA.

lb. rails from the Southern Railway for immediate rolling. The steel will be produced during the present week at Fairfield and the rails will be rolled during the week of Sept. 24 at the Ensley mill. This tonnage will provide only a few days of work at the rail mill. No other units will be affected at Ensley.

Cast iron pipe shipments continue at a favorable rate and September will be another good month. On Monday, Sept. 17, San Francisco opened bids on about 7000 tons of pipe for a high-pressure fire line. Local plants submitted bids.

Five blast furnaces and six open-hearth units are operating, no change having occurred in several weeks.

Bookings Up Slightly At Cincinnati

CINCINNATI, Sept. 18.—With the larger pig iron buyers out of the market, sales fluctuate in response to urgent needs of the smaller interests. A slight improvement in miscellaneous foundry operations has been reflected in a small increase in carload orders. Total purchases, however, did not exceed 300 tons. Those melters who failed to take all material on contract early in the quarter have been specifying steadily since Labor Day, thus boosting shipments. The general melt has not been increased to a noticeable degree, since operations of machine tool foundries are still low. Average production ranges from one to two days a week.

Foundry coke is moving slowly on contract, but new business is nil.

Sheet mill operations have been raised to 25 per cent of capacity by a slight increase in automotive demand coupled with better general specifications. An uncertain feeling toward the future still pervades the trade despite the somewhat better bookings. However, the outlook for domestic appliance manufacturers has improved.

The fabricated steel market continues to drag. A few small jobs constitute current business.

Scrap remains sluggish, reflecting the low rate of mill activity. New business is absent, while shipments on contract have decreased to almost the vanishing point. Yard supplies are increasing, but the trade is definitely pessimistic as to further business.

Water pipes manufactured at the British Mannesmann Tube Co., Ltd., Newport works, were shipped to Iceland, where they will be used to convey water from a hot volcanic spring to Reykjavik, the Icelandic capital, for domestic purposes.

Steel Production Unchanged In Philadelphia District



Moderate Gain in Miscellaneous Orders for Steel—Two Railroads Inquire for Fourth Quarter—Steel Scrap Bought at \$9.50

PHILADELPHIA, Sept. 18.—The past week has seen a moderate gain in orders for miscellaneous tonnages of steel. They include such lines as plates, shapes, steel bars, wire nails and sheets. The orders are generally for carlots or less, sometimes for only one or two items.

It is noticeable, however, that where mills would ordinarily expect carload orders, they often have been cut down to smaller lots for shipment by motor truck. This development indicates extreme caution in buying to cover immediate requirements, as well as the desire to keep inventories down to a minimum. Back of this trend is reflected uncertainty regarding the future.

One producer in this district, however, has accumulated a fair-sized backlog, based on present business activity, and is operating one structural mill night and day, while another is operating regularly on a day schedule. For the most part, though, mill operations are irregular, with complete shutdowns during part of the week to permit bookings to accumulate.

With some exceptions steel orders for September so far are well below those of August, itself a dull month. In excepted cases orders remain on a parity with those of the preceding month. No large buying movement in the near future appears to be in prospect.

A pick-up is expected through automotive sources, now that new models are getting into production, but it does not promise to be large. Railroad buying may see a slight bulge depending on results from inventories under way. The Pennsylvania and the Norfolk & Western have put out their usual estimates for the fourth quarter on which figures will be taken on Clayton bids. The amounts to be actually bought are undetermined. The Pennsylvania estimate, including miscellaneous lots of plates, shapes, bars, sheets, wheels, pig iron, etc., does not exceed 5000 tons, while the N. & W. requirements, consisting of plates, shapes and bars, aggregate 4500 tons.

Differences of views are expressed in the trade over suspension until Dec. 1 of the new quantity differ-

tials on plates and shapes. The proposal to establish Bethlehem, Pa., as a basing point for carbon steel billets has been definitely rejected, according to reports in the trade.

Open-hearth operations remain unchanged at 16 per cent of capacity.

Pig Iron

New business is confined to carlots or less. Producers are of the opinion that generally stocks in the hands of melters have been reduced to a low point and are hoping for an early buying movement.

Plates, Shapes and Bars

While there has been an increase in bookings, for the most part they are for small lots only. Most of the structural business consists of Government jobs, or jobs financed through PWA funds.

The Pennsylvania and the Norfolk & Western will both close Clayton bids Sept. 26 for fourth quarter estimates. The Pennsylvania inquiry calls for not more than 5000 tons of various products, including plates, shapes, bars, sheets, pig iron, etc. A separate inquiry on which bids will be received up to Sept. 26 calls for 50 tons of pipe and 100 tons of boiler tubes. This carrier received bids yesterday for 60 tons of sheet piling. The N. & W. fourth quarter inquiry involves 4500 tons of plates, shapes and bars. No large railroad buying movement is in sight. Tonnages for some lines to be bought at an early date will be determined largely by inventories now being made.

The Phoenix Bridge Co. has been awarded the contract for a railroad bridge over Cape Cod Canal for the War Department. The structure will call for 4900 tons of steel. The McClintic-Marshall Corp. was the low bidder on a bridge over Saugus River at Lynn, Mass., calling for 2500 tons. About 900 tons will be required for a plant for the Krebs Pigment & Color Corp., du Pont subsidiary, at Edge Moor, Del. Bids will be asked soon.

Sheets

The market is dull. With new models in production a pick-up in demand for automotive sheets is ex-

pected to develop soon. There has been a decline in bookings for the radio and stove makers.

Imports

The following iron and steel imports were received here last week: 4835 tons of chrome ore from Cuba; 594 tons of pig iron from British India; 68 tons of structural shapes, 54 tons of steel bars, 30 tons of steel bands and 8 tons of diamond plates from Belgium; and 26 tons of cold-drawn steel wire, 22 tons of steel bars, 14 tons of iron bars, 9 tons of steel tubes and 1 ton of steel rods from Sweden.

Warehouse Business

Jobbers report a mixed situation. Some find a mild improvement in demand while others report a decline. The general opinion is that September business is falling below that of August. Prices are unchanged.

Scrap

An eastern Pennsylvania consumer has bought No. 1 heavy melting steel at \$9.50 a ton. Otherwise the market is without feature.

Buffalo Scrap Sold for Export to Japan

BUFFALO, Sept. 18.—The Lackawanna plant of the Bethlehem Steel Corp. is scheduled to increase its open-hearth operations early this week by two furnaces, making five in all. Republic Steel Corp. continues to operate three and Wickwire-Spencer Corp. one. The Seneca sheet division of Bethlehem has increased operations to 30 per cent of capacity.

Some slight pickup is noticeable in the pig iron market, with more foundries reporting better melt. The heating and radiator industry is showing seasonal activity, as is the stove business. Shipments are mostly for car-load lots. The radiation industry is expecting favorable developments in connection with the home modernization program.

A local fabricator of structural steel has been awarded 100 tons for a New York State armory at Corning, N. Y. Considerable construction work is on architects' boards, but little of it has come out for bids. The Kensington high school will require 400 tons of reinforcing bars and a New York State project at Elmira, N. Y., will require 100 to 200 tons of bars.

For the first time in history, it is believed, some of the railroad scrap lists are going to seaboard for export, principally to Japan. The heavy exportation of scrap is expected, sooner or later, to affect prices in this market. This may occur this coming winter when boat scrap shipments will be nil. Some short rail sales at \$12 are reported.

Cleveland Rate Up Six Points to 21 Per Cent



**But Business Is Limited to Fill-in Orders
—Bolt and Nut Makers Reduce Prices
20 Per Cent — Consumer Stocks Being Depleted**

CLEVELAND, Sept. 18.—Ingot output in the Cleveland-Lorain territory was increased six points this week by the starting up of three open-hearth furnaces by the Corrigan, McKinney Steel Co. This company accumulated orders to permit the resumption of finishing mills for about two days' operations during the week.

The finished steel market continues very quiet. Orders for the heavier rolled steel products, principally bars, are fairly numerous, but in the aggregate do not make much tonnage. Some small-lot fill-in business in sheets is coming from the automotive industry and additional orders are being placed for parts for new models, which should stimulate activity in sheets and strip steel. Business booked by several mills so far this month has fallen behind that taken in the corresponding period of August. However, stocks of many consumers have been so reduced that an appreciable gain is looked for during the remainder of the month.

Mills have postponed until Dec. 1 the introduction of new quantity extras on plates and shapes which were to have become effective Oct. 1. These extras have brought considerable complaint from consumers. Bolt and nut manufacturers have made a price reduction of about 20 per cent for the fourth quarter.

Pig Iron

New orders were not plentiful the past week and few were for more than car loads. Foundries as a rule are not buying iron until they need it. Some of the business is coming from consumers who still have iron in stock but not the grade required to meet the customers' specifications. Producers are feeling the lack of demand from the automotive industry.

Sheets

The recent slight improvement in orders has not been maintained. Only a little fill-in tonnage is coming from the automotive industry. Mill operations are intermittent. The local continuous mill has accumulated enough orders to operate four days this week. Additional orders for automobile parts now pending are expected to be placed

this week. Complaint is being made that in some cases stamping plants affiliated with sheet mills are quoting lower prices than those not having any such affiliations are able to quote. Production of automobile bodies is being interrupted by non-delivery of upholstering material because of the textile strike.

Strip Steel

Little new business came out during the week. The trade is greatly disturbed by reports of sharp price concessions made on cold-rolled strip by two small producers in the Detroit territory.

Iron Ore

Consumption of Lake Superior ore during August amounted to 1,443,943 tons, a decrease of 155,922 tons from July. This compares with a melt of 2,611,903 tons in August last year. Ore stocks at furnaces Sept. 1 amounted to 27,857,633 tons, and stocks at furnaces and Lake Erie docks were 32,713,447 tons, as compared with 30,155,875 tons on Sept. 1 last year. There were 56 furnaces in blast using Lake ore Aug. 31, a decrease of 11 for the month.

Receipts at Lake Erie ports during August were 3,091,871 tons as compared with 3,362,090 tons during July and with 3,929,829 tons in August last year. Receipts at these ports for the season until Sept. 1 were 11,039,201 tons as against 7,753,731 tons during the same period last year. Shipments from these docks until Aug. 1 were 8,280,458 tons as against 6,069,779 tons during the same period last year. Receipts at other than Lake Erie ports to Sept. 1 were 4,070,816 tons as against 2,372,016 tons for the same period last year. The dock balance Sept. 1 was 4,855,814 tons, or 39,710 tons less than on the same date a year ago.

Bolts and Nuts

New discounts have been issued on machine and carriage bolts and nuts for the fourth quarter, representing a price reduction of almost 20 per cent. The new discounts are 70, 10 and 10. Concessions from the regularly quoted discounts have been rather common recently in some sections. S.A.E. semi-

finished hexagon nuts, under the new schedule, instead of carrying uniform discounts, have three price ranges according to size. These nuts, 1/4 to 7/16 in. in diameter, are 75 and 10 per cent; 1/2 in. to 1 in., 75 per cent, and over 1 in., 70 per cent off list. U. S. S. hexagon nuts, all sizes, are 70, 10 and 10 per cent off list. Tire bolts are 60 and 10 per cent off list. Stove bolts are unchanged. Bolt and nut business is not holding up to the August volume.

Bars, Plates and Shapes

Demand for bars from the automotive industry has improved slightly, some new releases coming from forge shops for automobile parts. The only structural award is 160 tons for an Ohio highway bridge. The Chesapeake & Ohio railroad has taken bids for a car dumper for Toledo taking 800 tons. For the Muskingum, Ohio, watershed conservancy project bids are scheduled to be taken before Oct. 15 and Nov. 1. Considerable tonnage in reinforcing bars, shapes and pipe is involved. This Federal-aid project calls for the construction of 12 dams. With the rail steel bars \$3 a ton below billet steel reinforcing bars, the former are being used for most public work.

Scrap

A local steel plant that has been taking a limited amount of blast furnace scrap has shut off shipments and the absence of any demand for these grades has resulted in a 25c. a ton reduction on borings, turnings and No. 2 busheling. There is a little demand for steel-making scrap in the Youngstown district, and dealers are paying \$9.25 for No. 2 heavy melting steel and \$9 to \$9.50 for compressed sheet steel.

Railroad Equipment

Lehigh Valley Railroad has been allotted \$3,000,000 by PWA which will be used for rebuilding 1500 box cars in its own shops and purchase of 300 50-ft. gondola and 100 65-ft. gondola cars. Road will also buy three Diesel-electric locomotives.

Bethlehem Steel Co. has ordered eight 70-ton air-dump cars from Magor Car Corp.

Gray Chemical Co., Roulette, Pa., has ordered two 8000-gal. aluminum tank cars from General American Transportation Corp.

Baltimore & Ohio has announced that unexpended funds from its PWA loan of \$4,279,244 will be used for repair of 100 locomotives and 7000 freight cars. Repair work has already been completed on 240 locomotives and 932 freight cars.

Pennsylvania Railroad's inquiry for electric locomotives has been raised to a maximum of 58 units.

RAILS

Cincinnati, New Orleans & Texas Pacific (Southern Railway) has placed 2000 tons of 130-lb. rails with Tennessee Coal, Iron & Railroad Co.

German Steel Business Continues to Expand—Machinery Trade Also Brisk

HAMBURG, Germany, Sept. 10 (By Special Correspondence).—

The boom in the German domestic market continues. The majority of leading German steel makers were forced in the last week of August to return to a three-shift operation and are now turning out steel in increasing quantities. Many works have been unable to cope with demand and stocks of semi-finished and finished steel are virtually non-existent, in spite of a 50 per cent advance in imports of finished steel from the Saar.

August was probably the best month for bars since 1928, orders for that product alone having exceeded 225,000 tons. Pig iron is the only product of which there are stocks, but the total is hardly more than 400,000 tons, equivalent to less than a fortnight's output. The majority of the demand is coming from domestic sources, but bars, joists and angles are in good demand for export.

Exports are running 30 to 40 per cent ahead of last year, and more than 40 per cent of all export transactions are now carried on by barter. The last big contract was signed with Yugoslavia. Steel makers are optimistic regarding business in the autumn.

Machinery Trade Improving

The machinery trade is also improving and it is noticed that this improvement is not irregular but almost uninterrupted from month to month. In January, 1933, the German machinery industry was operating at 32.4 per cent of the capacity; March, 1933, 34.3 per cent; June, 37.2 per cent; October, 41.3 per cent; December, 45.6 per cent; March, 1934, 52.6 per cent; June, 58.2 per cent, at present at 59.6 per cent.

Machinery exports to Russia have been almost nil this year, but shipments to other countries are up by 11.5 per cent compared with last year. At the moment negotiations are pending at Berlin and it is probable that Russia will again start buying in Germany. The trade balance which had been always much in favor of Germany was against her during the last two months.

Heavy Armament Buying

Armament buying by Russia and Japan is brisk. Germany does not feel this so much, though some Japanese orders for cartridge making machinery have been placed, as well as for various parts necessary for heavy guns and ships. Austria and Czechoslovakia have both received heavy orders for armor plates, sheets, steel for arms production, etc., and the Skoda works also has a fair order

for heavy guns. Some Austrian makers were forced to double operations on account of heavy Japanese orders.

Ply-Steel Uses Expanding

Ply-steel is finding a quickly expanding market in Germany. A great many products are already produced entirely of ply-steel, notably steel rails, which are made of a softer steel covered with a very hard steel, and stainless steel sheets, hoops, etc. Production of ply-steel rails alone is exceeding 10,000 tons monthly and the demand for stainless ply-steel is already exceeding calls for ordinary stainless.

Hydranalium Market Growing

Hydranalium is an aluminum alloy which is growing in the favor of industry in Germany. It is said to combine a tensile strength equal to that of steel with corrosion resistance, and is the same color as high chromium-nickel steels. At present it is in demand as a substitute for copper and brass products. Production of aluminum is scheduled at 35,000 tons this year compared with 23,000 tons last year and 18,000 tons two years ago, while it is expected that it will be possible to raise the figure to close to the full capacity of 50,000 tons next year.

Acquire Interest In Lumber Treating Company

THE Aluminum Co. of America and the Chicago Bridge & Iron Works have each acquired an interest in the American Lumber & Treating Co., Chicago, builders and operatives of plants for treating lumber with wolman salts. The process, which is called "Wolmanizing," utilizes the vacuum pressure method of treatment. The material to be treated is loaded on tram cars, with spacers between to allow free circulation of the treating solution. The loaded cars are placed in a large treating chamber designed to withstand both vacuum and pressure.

Continental Roll & Steel Foundry Co. has been awarded contract for the stands which will be used on the new 38-in. continuous hot strip, four-high mill which is to be installed at the Gary works of the Illinois Steel Co.

F. L. & J. C. Codman Co., maker of buffing and polishing wheels, has removed from South Boston to Rockland, Mass., affording 80 per cent increase in floor space.

Girdler Cites Advantages Of Employee Representation—Flays Union Tactics



T. M. GIRDLER

ADVANTAGES of the employee representation plan of collective bargaining, as contrasted with the destructive practices of professional labor unions, were stressed by Tom M. Girdler, chairman and president, Republic Steel Corp., in an address before the Association of Iron and Steel Electrical Engineers at Cleveland, on Sept. 18.

Charging that the unsettled and turbulent labor situation throughout the country is one of the fundamental causes for the prevailing uncertainty and halting of business, Mr. Girdler made an earnest plea for closer relations between employers and employees. In discussing collective bargaining, he said:

"The employee representation plan is founded upon the premise that employees and employers have mutual interests, best served by the maintenance of harmony, confidence and understanding between employer and employees, under a collective bargaining plan which works for the benefit of both. Employees are represented by men they know personally, who are thoroughly familiar with local conditions and know from experience what they are talking about.

"The employee representation plan provides for day-to-day action. Issues which arise may be discussed and settled immediately. It gives free play to individual ability, encourages the use of the incentive system and offers employees opportunities for advancement based upon efficiency, intelligence and capacity for leadership.

Employees Become More Reasonable

"As time goes on, the employees' representatives become more familiar with company affairs. They begin to understand that before money can be paid out, money must come in. So they learn, after a while, what is a reasonable thing to ask for and what is unreasonable. The management in the same way learns what is reasonable and what is unreasonable.

"There finally develops a kind of working agreement or understanding,

a sort of partnership between men and management, that would be absolutely impossible under the theory of perpetual conflict which apparently animates the actions of the American Federation of Labor.

"The professional labor leaders, greedy for power and for the payment of dues into the treasury of their organizations, seem to think the National Industrial Recovery Act was passed for their particular private benefit, and they seek to give the impression that the strong arm of the Government will actually force control into their hands even in respect to an industry in which the majority of the workers do not want them and are entirely satisfied with their own form of collective bargaining.

Unionization Would Not Add to Workers' Income

"If successful, would the union add to the income of the workers? On the contrary, the union would take from them vast sums in the form of dues for which they never make any public accounting. Apparently the officers of the unions can spend these vast sums of money without being responsible to anyone. Is it conceivable that the business agents of labor unions, who care nothing about plant conditions, can be as well qualified to discuss grievances as representatives chosen by the men themselves from their own number? I think not.

"The business agent of the union does not come to promote peace. He and his union thrive through promoting discord. The more dissatisfaction he can create, the greater the chance of securing new recruits for the union and the more dues for its treasury. The union continually seeks, and always has sought, to create a spirit of hostility and strife between employees and employers, where otherwise peace and harmony would prevail.

"I do not question the right of the worker to join any organization he chooses. But, on the other hand, I deny the right, morally or legally, of the organization to which he does not

belong, to attempt by force, by intimidation or otherwise, to compel him to submit to its will, and I intend to continue to stand as I have in the past, firmly against the aggression of such labor leaders."

There ought to be statutes in the United States, Mr. Girdler said, similar to the provision of the British Trade Disputes and Trade Unions Act which, in England, makes it illegal and criminal to intimidate workers by force and violence such as is practised by strikers.

Attacks Majority Rule in Collective Bargaining

In discussing proportional representation versus majority rule in collective bargaining, Mr. Girdler stated:

"When Congress provided for collective bargaining, I do not believe it intended to say that a bare majority of workers could prevent the minority from selecting their own representatives to deal with the management. Such an interpretation of collective bargaining would deprive the worker of freedom of action, instead of giving him greater liberty, and would subject him to the will of agents whom he did not choose and in whom he has no confidence.

"I am advised by my counsel and believe that such ruling is an incorrect interpretation of the law. It is simply a further attempt to impose the closed shop on industry."

Steel Institute Joins Standards Association

THE American Iron and Steel Institute has become a member of the American Standards Association. As the coordinating organization for the entire iron and steel industry, the institute has an important interest in the progress of standardization affecting both the products and raw materials of the industry. The institute is already represented in the safety work of the standards association.

C. & O. to Build Car Dumper at Toledo

BIDS for a car dumper to be erected at Toledo, Ohio, have been taken by the Chesapeake & Ohio railroad. This will be a large dumper capable of handling 120-ton coal cars at an unloading rate of 50 cars per hr. This railroad now has two car dumpers at Toledo, but desires to increase its coal handling capacity at that port. This will be the first car dumper to be purchased for a Lake port for several years.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
F.o.b. Duluth	1.95c.
Del'd Detroit	1.95c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
Del'd Philadelphia	2.09c.
Del'd New York	2.13c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.10c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Terre Haute, Ind.	1.75c.
F.o.b. Louisville, Ky.	2.10c.
F.o.b. Danville, Pa.	1.80c.
F.o.b. Berwick, Pa.	1.80c.

Cold Finished Bars and Shafting*

Base per Lb.	
F.o.b. Pittsburgh	2.10c.
F.o.b. Chicago	2.15c.
F.o.b. Gary	2.15c.
F.o.b. Cleveland	2.15c.
F.o.b. Buffalo	2.20c.
Del'd Detroit	2.30c.
Del'd eastern Michigan	2.35c.

* In quantities of 10,000 to 10,000 lb.

Fence and Sign Posts

Angle Line Posts

Base per Net Ton	
F.o.b. Pittsburgh	\$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston	50.00
F.o.b. cars dock Pacific ports	68.00

Plates

Base per Lb.	
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.985c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.985c.
Del'd New York	2.08c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh.	3.00c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	2.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

Base per Lb.	
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.985c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.005c.
Del'd New York	2.025c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.25c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

Base per Lb.	
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.	
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.14c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. dock cars Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. dock cars Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila.	2.79c.
No. 10 gage, f.o.b. Birmingham	2.55c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.24c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20 gage, f.o.b. dock cars Pacific ports	3.50c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.39c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. dock cars Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating	3.40c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.10c.
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Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock, Pacific Coast	3.35c.

Tin Plate

Base per Box	
Standard cokes, f.o.b. P'gh district	\$3.25
Standard cokes, f.o.b. Gary	3.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)	
(Per Package, 20 x 28 in.)	
8-lb. coating I.C.	\$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.

Base per Lb.	
All widths up to 24 in., P'gh.	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	2.10c.
Cooperage stock, Chicago	2.20c.

Cold-Rolled Strips

Base per Lb.	
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.85c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 16 and heavier, Pittsburgh or Cleveland	3.15c.
F.o.b. Worcester	3.55c.
No. 17 and lighter, Pittsburgh or Cleveland	3.30c.
F.o.b. Worcester	3.70c.

Hot-Rolled Rail Steel Strips

Base per Lb.	
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade Per Lb.

Bright wire	2.30c.
Spring wire	3.20c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland.	

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

Base per Keg

Standard wire nails	\$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
18 gage and finer	5.10

Base per 100 Lb.

Annealed fence wire	\$2.45
Galvanized fence wire	3.30
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	63.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh; Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh; Duluth, Minn., and Worcester, Mass., mill prices are \$3 a ton over Pittsburgh; Birmingham mill prices are \$3 a ton over Pittsburgh).

On manufacturers' wire prices at Pacific ports are \$9 above the Pittsburgh base. On high-carbon spring wire, prices at Pacific ports are also \$9 above Pittsburgh. On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi are \$6 a ton over Pittsburgh, while New Orleans and Pacific Coast prices are \$8 over Pittsburgh. Steel nails, on fence wire Pacific Coast prices are \$11 a ton above Pittsburgh.

Wire Hoops, Twisted or Welded

Base per Net Ton	
F.o.b. Pittsburgh	35 and 2 1/2 off
F.o.b. Chicago	35 off

Bale Ties, Single Loop

Base per Net Ton	
F.o.b. Pittsburgh	\$63.00
F.o.b. Chicago	64.00
F.o.b. Duluth	65.00
F.o.b. Cleveland	63.00
F.o.b. Birmingham	66.00
F.o.b. cars dock Houston, Galveston, Beaumont, Orange or Corpus Christi, Tex.	72.00
F.o.b. cars dock Pacific ports	74.00

STEEL AND WROUGHT PIPE

AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel	Black Galv.	Wrought Iron	Black Galv.
Inches		Inches	
1/4	51 1/2	29 1/2	51 1/2
3/8	51 1/2	35	51 1/2
1/2	51 1/2	47	51 1/2
3/4	51 1/2	55	51 1/2
1	51 1/2	64	51 1/2

Lap Weld

2	60	51	37	22 1/2
2 1/2	63	54	38	25
3	65	56	40	28 1/2
4	68	59	42	31 1/2
5	71	62	44	34 1/2
6	74	65	46	37 1/2
7	77	68	48	40 1/2
8	80	71	50	43 1/2
9	83	74	52	46 1/2
10	86	77	54	49 1/2
11	89	80	56	52 1/2

Butt Weld, extra strong, plain ends			
1/4	48 1/2	33 1/2	13
3/8	51 1/2	38	13 1/2
1/2	54 1/2	47 1/2	17 1/2
3/4	57 1/2	55 1/2	21 1/2
1	60 1/2	64 1/2	25 1/2
1 1/4	63 1/2	72 1/2	29 1/2
1 1/2	66 1/2	80 1/2	33 1/2
1 3/4	69 1/2	88 1/2	37 1/2
2	72 1/2	96 1/2	41 1/2

Lap Weld, extra strong, plain ends			
2	58	50	26
2 1/2	62	54	29
3	65 1/2	57 1/2	32 1/2
4	69 1/2	61 1/2	36 1/2
5	73 1/2	65 1/2	39 1/2
6	77 1/2	69 1/2	43 1/2
7	81 1/2	73 1/2	46 1/2
8	85 1/2	77 1/2	50 1/2
9	89 1/2	81 1/2	53 1/2
10	93 1/2	85 1/2	57 1/2
11	97 1/2	89 1/2	60 1/2

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5% off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5% off are allowed to consumers and three 5% off to jobbers.

Note—Chicago district mills have a base

two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes
(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

	Cold Drawn	Hot Rolled
1 in. o.d. 13 B.W.G.	\$ 8.60	\$7.93
1 1/4 in. o.d. 13 B.W.G.	10.19	9.26
1 1/2 in. o.d. 13 B.W.G.	11.26	10.23
1 3/4 in. o.d. 13 B.W.G.	12.81	11.64
2 in. o.d. 13 B.W.G.	14.35	13.04
2 1/4 in. o.d. 13 B.W.G.	16.00	14.54
2 1/2 in. o.d. 12 B.W.G.	19.29	17.54
2 3/4 in. o.d. 12 B.W.G.	20.45	18.59
3 in. o.d. 12 B.W.G.	21.45	19.50
3 1/4 in. o.d. 11 B.W.G.	25.22	23.63
3 1/2 in. o.d. 11 B.W.G.	27.09	25.62
4 in. o.d. 10 B.W.G.	33.60	30.54
4 1/4 in. o.d. 10 B.W.G.	41.08	37.35
5 in. o.d. 9 B.W.G.	51.56	46.87
6 in. o.d. 7 B.W.G.	79.15	71.96

Extras for less-carload quantities:
25,000 lb. or ft. to 29,999 lb. or ft. 1 %
10,000 lb. or ft. to 24,999 lb. or ft. 1 1/2 %
2,000 lb. or ft. to 9,999 lb. or ft. 2 %
Under 2,000 lb. or ft. 4 %

Hot-Finished Lapweld Steel Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

dunlin		in caribou lots	
1 1/4 in. o.d.	13 B.W.G.		\$ 9.73
1 1/2 in. o.d.	13 B.W.G.		11.66
1 3/4 in. o.d.	13 B.W.G.		12.28
2 in. o.d.	13 B.W.G.		13.73
2 1/4 in. o.d.	12 B.W.G.		16.58
2 1/2 in. o.d.	12 B.W.G.		17.54
3 in. o.d.	12 B.W.G.		18.35
3 1/4 in. o.d.	11 B.W.G.		21.56
3 1/2 in. o.d.	11 B.W.G.		23.15
4 in. o.d.	10 B.W.G.		28.66
4 1/2 in. o.d.	10 B.W.G.		35.21
5 in. o.d.	9 B.W.G.		45.21
6 in. o.d.	7 B.W.G.		68.14

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Boiler Tubes
bes
f.o.b. Pitts-
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old	Hot
own	Rolled
60	\$7.82
19	9.26
26	10.23
81	11.64
35	13.04
96	14.54
29	17.54
45	18.50
45	19.50
22	22.93
99	24.67
50	30.54
98	37.35
56	46.87
15	71.96

uantities:
or ft. 5 %
or ft. 12 1/2 %
or ft. 25 %
..... 40 %

Pressure Tubes
f.o.b. Pitts-
ta)

.....	\$ 9.73
.....	11.06
.....	12.38
.....	13.79
.....	16.58
.....	17.54
.....	18.50
.....	21.56
.....	23.15
.....	28.66
.....	35.32
.....	44.25
.....	68.14

base
plus 5 %
plus 12 1/2 %
plus 25 %
plus 40 %

ER TUBES
Pittsburgh

44	
15 and 16	
16 and 18	
17 and 18	
18 and 18	
20 and 18	
21 and 18	
1 1/2 to 1 3/4	
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R PIPE

Per Net Ton	
.....	\$47.00
.....	50.00
ork.....	45.00
.....	48.00
.....	39.00
.....	42.00

extra

RIALS

plies

lb.	
.....	\$36.37 1/2
.....	2.55

oints

STONS	
.....	\$35.00
per	
.....	34.00
per 100 LB.	
.....	\$2.40
.....	2.40
.....	1.90
.....	3.50

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At the METAL SHOW

BETHLEHEM'S EXHIBIT at the National Metal Exposition will contain a working model of its electrically operated bar heat-treating plant.

This plant has placed Bethlehem in an exceptionally favorable position to meet industry's increasing demand for heat-treated steel. It is the largest in the world devoted to the hardening and annealing of mill-length bars, and embodies the most recent improvements in heat-treating practice, applying on a commercial scale the exact methods of the laboratory. The timing of all operations is automatically controlled.

The working model at the exhibit shows the bars in motion, and reproduces the furnaces in which they are pre-heated, then heated for quenching. It shows the automatic crane which removes the bars and lowers them into the quenching tank, and the furnaces, also electrically operated, in which the quenched bars are annealed.

Visitors to the Exposition and the National Metal Con-

gress, at New York, October 1 to 5, are invited to see the Bethlehem exhibit. In addition to the working model of the heat-treating plant, other interesting features of the Bethlehem exhibit will include:

Bethlehem Heat-Treated Wrought-Steel Car Wheels

Great strength and high shock-resisting properties result from the forging and rolling operations during the manufacture of these wheels. They are armored against wear by hard, tough, heat-treated rims. An interesting series of new, enlarged transparencies and a display, showing wheels at different stages of completion, will describe their manufacture and heat-treatment.

Bethanized Wire

Product of a new and far-reaching development in zinc-coating, this wire is remarkably free from the limitations of older galvanizing methods. The coating is tighter, far more ductile, and can be applied in heavier weights than were ever before possible.

Bethlehem Alloy Studs and Bolts

Specialty products for high temperatures, high pressures and corrosion resistance. Also, heat-treated and oil-quenched nuts; and the hot-forged nut, made by Bethlehem's exclusive process.

Bethadur and Bethalon

Corrosion-resisting steels covering a wide range of applications.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, General Offices: BETHLEHEM, PA.



(Co.
BOLTS.

(F.a.b. E

Machine
Carriage
Lag bolts
Flaw bolts
Hot-pressed
square
Hot-pressed
hexagonal
C.P.C. and
or tapped
Semi-finished
sizes . . .
Semi-finished
1/4 in. to
1/2 in. to
larger than
Store bolts
Store bolts
Store bolts
Store bolts
Store bolts
Store bolts
Tire bolts

F.a.b. Pitt
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Alloy a

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Uncropped.

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F.a.b. I

Massillon, I

Base price

Price del'

A

F.a.b. E

Bethlehem.

Open-hearth

Delivered p

S.A.E.

Series

Numbers

2000 (1/4 %

2100 (2 1/4 %

2200 (3 1/2 %

2300 (5 % N

2400 Nickel

2500 Nickel

2600 Nickel

2700 Chromi

2800 Chromi

2900 Chromi

3000 Nickel

3100 Nickel

3200 Nickel

3300 Nickel

3400 Nickel

3500 Nickel

3600 Nickel

3700 Nickel

3800 Nickel

3900 Nickel

4000 Nickel

4100 Nickel

4200 Nickel

4300 Nickel

4400 Nickel

4500 Nickel

4600 Nickel

4700 Nickel

4800 Nickel

4900 Nickel

5000 Nickel

5100 Nickel

5200 Nickel

5300 Nickel

5400 Nickel

5500 Nickel

5600 Nickel

5700 Nickel

5800 Nickel

5900 Nickel

6000 Nickel

(Continued from Page 66)
BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts	
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
Per Cent Off List	
Machine bolts	70, 10 and 10
Carriage bolts	70, 10 and 10
Lat bolts	70, 10 and 10
Flw bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped	70
Hot-pressed nuts, blank or tapped	70, 10 and 10
Hexagons	70, 10 and 10
C&E and 1 square or hex nuts, blank or tapped	70, 10 and 10
Semi-finished hexagon nuts U.S.S. all sizes	70, 10 and 10
Semi-finished hexagon nuts, S.A.E.	70, 10 and 10
1/4 in. to 7/16 in. diameter	75
1/2 in. to 1 in. diameter	75
Larger than 1 in. diameter	70
Store bolts in packages, Pittsburgh	75
Store bolts in packages, Cleveland	75
Store bolts in packages, Chicago	75
Store bolts in bulk, P'gh	83
Store bolts in bulk, Chicago	83
Store bolts in bulk, Cleveland	83
Tie bolts	60 and 10

Large Rivets	
(1/2-in. and larger)	
Base per 100 Lb.	
F.o.b. Pittsburgh or Cleveland	\$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets	
(7/16-in. and smaller)	
Per Cent Off List	
F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws	
(Freight allowed up to but not exceeding 6c per 100 lb. on lots of 200 lb. or more)	
Per Cent Off List	
Milled cap screws, 1 in. dia. and smaller	75, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread 1/4 in. and smaller	75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	85
Upset set screws, cut and oval point	75 and 10
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Ingots	
(F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem)	
Uncropped	\$40 per gross ton

Alloy Steel Blooms, Billets and Slabs	
(F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem)	
Base price, \$49 a gross ton	
Price del'd Detroit is \$52.	

Alloy Steel Bars	
(F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton)	
Open-hearth grade, base	2.45c.
Delivered price at Detroit is	2.60c.
S.A.E.	
Series	
Numbers	
Differential per 100 lb.	

2000 (1/4% Nickel)	\$0.25
2100 (2/4% Nickel)	0.55
2200 (3/4% Nickel)	1.50
2300 (5% Nickel)	2.25
2100 Nickel Chromium	0.55
2200 Nickel Chromium	1.35
2300 Nickel Chromium	3.80
2400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4400 Nickel Molybdenum (0.25 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.80 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
4100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Carbon Nickel Vanadium	1.50
Carbon Vanadium	0.95
These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is 1/4c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.	

Alloy Cold-Finished Bars	
(F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.)	
STAINLESS STEEL No. 302	
(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.17 to 20% C)	
(Base Prices, F.o.b. Pittsburgh)	
Per Lb.	
Bars	23c.
Flats	26c.
Sheets	33c.
Hot-rolled strip	20 1/2 c.
Cold-rolled strip	27c.

Raw and Semi-Finished Steel

Carbon Steel Rolling Ingots	
(F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham)	
Uncropped	\$29 per gross ton

Carbon Steel Forging Ingots	
(F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham)	
Uncropped	\$31 per gross ton

Billets, Blooms and Slabs	
(F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham)	
Per Gross Ton	
Rerolling	\$27.00
Forging quality	32.00
Delivered Detroit	
Rerolling	\$30.00
Forging	35.00

Billets Only F.o.b. Duluth	
Rerolling	\$29.00
Forging	34.00

Sheet Bars	
(F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.)	
Per Gross Ton	
Open-hearth or Bessemer	\$28.00

Skelp	
(F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.)	
Per Lb.	
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Tube Rounds	
Base per Lb.	
F.o.b. Pittsburgh	1.85c.
F.o.b. Chicago	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
F.o.b. Birmingham	1.95c.

Wire Rods	
(Common soft, base)	
Per Gross Ton	
F.o.b. Pittsburgh	\$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$19.50	\$20.00	\$19.00	\$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	19.50	20.00	19.00	20.50
Sparrows Point, Md.	19.50	20.00	19.00	20.50
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jacksc, Ohio	20.25	20.25	19.75	19.00
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	19.00
Duluth, Minn.	19.00	19.00	19.50	19.00
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	17.50	17.50	19.00

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	\$20.00	\$20.50	\$19.50	\$21.00
Brooklyn				
From East Pa. or Buffalo	21.77	22.27	21.27	22.77
Newark or Jersey City, N. J.				
From East Pa. or Buffalo	20.89	21.39	20.39	21.89
Philadelphia				
From Eastern Pa.	20.26	20.76	19.76	21.26
Cincinnati				
From Hamilton, Ohio	19.51	19.51	19.01	20.01
Canton, Ohio				
From Cleveland and Youngstown	19.76	19.76	19.26	20.26
Columbus, Ohio				
From Hamilton, Ohio	20.50	20.50	19.50	20.50
Manassfield, Ohio				
From Cleveland and Toledo	20.26	20.26	19.26	20.26
Indianapolis				
From Hamilton, Ohio	20.77	20.77	19.77	20.77
South Bend, Ind.				
From Chicago	20.55	20.55	19.55	20.55
Milwaukee				
From Chicago	19.50	19.50	18.50	19.50
St. Paul				
From Duluth	20.94	20.94	19.94	20.94
Davenport, Iowa				
From Chicago	20.26	20.26	19.26	20.26
Kansas City				
From Granite City	21.04	21.04	20.04	21.04

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	
Johnson City, Tenn.	\$23.50
Del'd Chicago	23.50
Johnson City, Tenn. (off grade)	19.50

GRAY FORGE PIG IRON

Valley furnace	\$18.25
CHARCOAL PIG IRON	
Lake Superior furnace	\$21.00
Delivered Chicago	24.04
Delivered Buffalo	24.28

CANADA

Pig Iron

Per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	31.00

Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$23.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Per Gross Ton	
Domestic, 80% (carload)	\$35.00

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$26.00

Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	136.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads) (duty paid)	31.00
14% to 16% (less carloads)	38.50

Silvery Iron

F.o.b. Jackson, Ohio, Furnace	
Per Gross Ton	
6%	\$22.75
7%	23.75
8%	24.75
9%	25.75
10%	26.75
11%	27.75
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed.	

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace	
Per Gross Ton	
10%	\$27.75
11%	28.75
12%	30.25
13%	31.75
Manganese 1 1/2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 ton additional.	
Base prices at Buffalo are \$1.25 a ton higher than at Jackson.	

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads	\$1.35 to \$1.40
Ferrotungsten, less carloads	1.45 to 1.55
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered in carloads	0.90c.
Ferrocromium, 2% carbon	16.50c. to 17.00c.
Ferrocromium, 1% carbon	17.50c. to 18.00c.
Ferrocromium, 0.10% carbon	19.50c. to 20.00c.
Ferrocromium, 0.06% carbon	20.00c. to 20.50c.
Ferrocromium, del. per lb. contained V.	\$2.70 to \$2.90
Ferrocromium, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton	\$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18% Rockdale, Tenn., base, per gross ton with \$2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$38.00
Ton lots or less, per ton	45.50
Silico-manganese, gross ton, delivered	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	\$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$10.50 to \$11.00
No. 2 heavy melting steel	9.50 to 10.00
No. 2 railroad wrought	10.50 to 11.00
Scrap rails	10.50 to 11.00
Rails 3 ft. and under	13.50 to 14.00
Compressed sheet steel	10.50 to 11.00
Hand bundled sheet steel	9.50 to 10.00
Hvy. steel axle turnings	9.50 to 10.00
Machine shop turnings	7.00 to 7.50
Short shov. turnings	7.00 to 7.50
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron car wheels	11.50 to 12.00
Heavy breakable cast	10.50 to 11.00
No. 1 cast	11.50 to 12.00
Rail knuckles and couplers	13.50 to 14.00
Rail, coil and leaf springs	13.50 to 14.00
Roller steel wheels	13.50 to 14.00
Low phos. billet crops	13.50 to 14.00
Low phos. sheet bar crops	12.50 to 13.00
Low phos. plate scrap	12.50 to 13.00
Low phos. punchings	13.00 to 13.50
Steel car axles	13.50 to 14.00

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$8.50 to \$9.00
No. 2 heavy melting steel	8.00 to 8.50
Compressed sheet steel	8.00 to 8.50
Light bundled sheet stampings	6.50 to 7.00
Drop forge flashings	7.50 to 8.00
Machine shop turnings	6.00 to 6.50
Short shoveling turnings	6.50 to 7.00
No. 1 busheling	7.50 to 8.00
Steel axle turnings	7.50 to 8.00
Low phos. billet crops	13.25 to 13.75
Cast iron borings	6.25 to 6.75
Mixed borings and short turnings	6.25 to 6.75
No. 2 busheling	6.25 to 6.75
No. 1 cast	11.50 to 11.75
Railroad grate bars	7.00 to 7.50
Store plate	6.50 to 7.00
Rails under 3 ft.	14.00 to 14.50
Rails for rolling	15.50 to 16.00
Railroad malleable	11.50 to 12.00
Cast iron car wheels	9.75 to 10.00

BUFFALO

Per gross ton, f.a.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$9.50 to \$10.50
No. 2 heavy melting scrap	8.50 to 9.00
Scrap rails	9.50 to 10.00
New hydraulic comp. sheets	8.50 to 9.00
Old hydraulic comp. sheets	7.50 to 8.00
Drop forge flashings	8.50 to 9.00
No. 1 busheling	8.50 to 9.00
Hvy. steel axle turnings	6.50 to 7.00
Machine shop turnings	4.00 to 4.50
Knuckles and couplers	11.00 to 11.50
Coil and leaf springs	11.00 to 11.50
Roller steel wheels	11.00 to 11.50
Low phos. billet crops	11.50 to 12.00
Short shov. steel turnings	5.50 to 6.00
Short mixed borings and turnings	5.50 to 6.00
Cast iron borings	5.50 to 6.00
No. 2 busheling	5.00 to 5.50
Steel car axles	10.50 to 11.00
Iron axles	10.50 to 11.00
No. 1 machinery cast	10.00 to 10.50
No. 1 cupola cast	9.00 to 9.50
Store plate	8.50 to 9.00
Steel rails, 3 ft. and under	12.00 to 12.50
Cast iron car wheels	10.00 to 10.50
Industrial malleable	10.00 to 10.50
Railroad malleable	10.00 to 10.50
Chemical borings	7.00 to 7.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$5.50 to \$6.00
Scrap T rails	5.50 to 6.00
Heavy breakable cast	5.00 to 5.25
Breakable cast	6.00 to 6.50
Machine shop turnings	1.00 to 1.25
Bundled skeleton, long	3.30 to 3.50
Forge flashings	4.25 to 4.50
Blast furnace scrap	2.00 to 2.50
Shafting	11.00 to 11.25
Steel car axles	10.50 to 11.00
Cast iron borings, chemical	7.00 to 7.50
Store plate	6.50
Per gross ton delivered consumers' yards:	
Textile cast	\$7.50 to \$9.00
No. 1 machinery cast	7.50 to 9.00
Railroad malleable	11.00 to 11.50

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$7.00 to \$8.00
No. 2 heavy melting steel	6.50 to 7.50
Heavy breakable cast	6.00 to 6.50
No. 1 machinery cast	7.00 to 7.50
No. 2 cast	6.25 to 6.75
Store plate	5.00 to 5.50
Steel car axles	11.50 to 12.00
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	6.50 to 7.00
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for re-rolling	7.50 to 8.50
Short shoveling turnings	2.50 to 3.00
Machine shop turnings	2.50 to 3.00
Cast borings	3.50 to 3.75
Cast borings (chemical)	2.00 to 2.50
Unprepared yard iron and steel	3.00 to 4.00
Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$10.25
No. 1 hvy. cast (cupola size)	9.00
No. 2 cast	8.00

*For direct car loading only.
†Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$8.50
Scrap steel rails	9.00
Short shoveling turnings	5.50
Store plates	6.50
Steel axles	\$8.50 to \$11.00
Iron axles	10.50 to 11.00
No. 1 railroad wrought	5.50
Rails for rolling	10.50
No. 1 cast	9.50 to 10.00
Tramcar wheels	9.00 to 9.50
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$8.75 to \$9.25
No. 1 heavy melting	8.00 to 8.50
No. 2 heavy melting	6.50 to 7.00
No. 1 locomotive tires	9.50 to 10.00
Misc. stand-sec. rails	8.75 to 9.25
Railroad springs	9.00 to 9.50
Bundled sheets	6.00 to 6.50
No. 12 railroad wrought	8.00 to 8.50
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	2.50 to 3.00
Rails for rolling	9.75 to 10.25
Machine shop turnings	2.50 to 3.00
Heavy turnings	5.50 to 6.00
Steel car axles	10.50 to 11.00
Iron car axles	12.50 to 13.00
No. 1 railroad wrought	3.50 to 4.00
Steel rails less than 3 ft.	10.75 to 11.25
Steel angle bars	9.00 to 9.50
Cast iron car wheels	7.50 to 8.00
No. 1 machinery cast	8.50 to 9.00
Railroad malleable	8.50 to 9.00
No. 1 railroad cast	8.50 to 9.00
Store plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	\$6.75 to \$7.25
Borings and short turnings	4.75 to 5.25

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores Delivered Lower Lake Ports

Per Gross Ton	
Old range, Bessemer, 51.5% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.85
Mesabi, Bessemer, 51.50% iron	4.45
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore C.I.F. Philadelphia or Baltimore

Per Unit	
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	9.50c.
Iron, low phos., Swedish, average 68% iron	9.50c.
Iron, basic or foundry, Swedish, average, 65% iron	9c.
Iron, basic or foundry, Russian, aver. 65% iron	9c.
Manganese, Caucasian, washed 52% manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	20c.
Manganese, Brazilian, 46 to 48%	20c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered*	\$17.50 to \$18.50
Tungsten, domestic scheelite, delivered†	17.00

Per Gross Ton

Chrome, 45%, Cr ₂ O ₃ , crude, c.i.f. Atlantic Seaboard	\$17.00
Chrome, 48% Cr ₂ O ₃ , c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.
†Nominal; no supplies available.

FLUORSPAR

Per Net Ton	
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines for all-rail shipment	\$15.50 to \$16.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	17.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	\$15.50 to 16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

Per Net Ton	
Furnace, f.o.b. Connellsville	\$3.85
Prompt	
Foundry, f.o.b. Connellsville	\$4.60 to 5.10
Prompt	
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	9.00

Long turnings	\$3.75 to \$4.25
No. 1 machinery cast	9.00 to 9.50
Automotive cast	9.75 to 10.25
Hydraulic comp. sheets	6.75 to 7.25
Store plate	6.25 to 6.75
New factory busheling	5.75 to 6.25
Old No. 2 busheling	4.00 to 4.50
Sheet clippings	5.00 to 5.50
Flashings	5.50 to 6.00
Low phos. plate scrap	7.00 to 7.50

CANADA

Dealers' buying prices per gross ton:

Toronto Montreal	
Heavy melting steel	\$5.50 \$5.50
Rails scrap	6.00 6.00
Machine shop turnings	2.50 2.50
Boiler plate	4.50 4.50
Heavy axle turnings	2.50 2.50
Cast borings	3.00 3.00
Steel borings	2.00 2.00
Wrought pipe	2.50 2.50
Steel axles	4.50 4.50
Axles wrought iron	4.50 4.50
No. 1 machinery cast	7.75 7.00
Store plate	4.50 5.00
Standard car wheels	7.25 7.00
Malleable	6.75 7.00

Coal

Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	\$1.80 to \$2.30
Mine run cooking coal f.o.b. W. Pa.	2.05 to 2.35
Gas coal, 1/4-in. f.o.b. Pa. mines	2.25 to 2.35
Mine run gas coal, f.o.b. Pa. mines	2.05 to 2.45
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.85
Gas slack, f.o.b. W. Pa. mines	1.90 to 2.10

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.40c.
No. 5 industrial fuel oil	3.30c.

Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.50c.
No. 4 industrial	5.25c.
No. 5 industrial	4.50c.

REFRACTORIES

Fire Clay Brick

Per 1000 f.o.b. Works	
High-heat intermediate Duty Brick	Duty Brick
Pennsylvania	\$45.00
Maryland	45.00
New Jersey	55.00
Ohio	45.00
Kentucky	45.00
Missouri	45.00
Illinois	45.00
Ground fire clay, per ton	7.00

Chrome Brick

Per Net Ton	
Standard size	\$45.00

Silica Brick

Per 1000 f.o.b. Works	
Pennsylvania	\$45.00
Chicago	50.00
Birmingham	55.00
Silica clay, per ton	8.00

Magnesite Brick

Per Net Ton	
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$65.00
Unburned, f.o.b. Baltimore	55.00
Imported grain magnesite, f.o.b. Baltimore and Chester, Pa.	45.00
Domestic grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates, structural shapes	3.15c.
Soft steel bars, small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock—	
Rounds and hexagons	3.45c.
Squares and flats	3.45c.
Hoops and bands under 1/4 in.	3.20c.
25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more	3.95c.
bundles	2.95c.
Galv. corrug. sheets (No. 28), per	
square (more than 3750 lb.)	\$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count,	
65 per cent off list.	
Machine bolts, 100 count,	
65 per cent off list.	
Carriage bolts, 100 counts,	
65 per cent off list.	
Nuts, all styles, 100 count,	
65 per cent off list.	
Large rivets, base per 100 lb.	\$3.50
Wire, black, soft ann'd, base per	
100 lb.	\$2.70c.
Wire, galv. soft, base per 100 lb.	\$2.95c.
Common wire nails, per keg	\$2.83c.
Cement coated nails, per keg	\$2.83c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.
*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fn. steel bars and shafting	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.95c.
Spikes (9/16 in. and lighter)	3.50c.
Track bolts	4.65c.
Rivets, structural (keg lots)	3.50c.
bolts, boiler (keg lots)	3.60c.
Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq. tap. or	60 and 5
blank	60 and 5
Hot-pressed nuts, hex. tap. or	60 and 5
blank	60 and 5
Hex. head and cap screws	80
Cup point set screws	70 and 10
Flat head bright wood screws	37 1/2 and 10
Spring cotter pins	50
Store bolts in full packages	70 and 10
Rd. hd. tank rivets 7/16 in. and	
smaller	57 1/2
Wrought washers	\$4.50 off list
No. 8 black ann'd wire per 100 lb.	\$3.85
Com. wire nails, base per keg	3.05c.
Cement c'd nails, base per keg	3.05c.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.22c.
Iron bars, swed. charcoal	6.50 to 7.25c.
Cold-fn. shafting and screw stock;	
Rounds and hexagons	3.92c.
Flats and squares	4.42c.
Cold-roll. strip, soft and quarter	
hard	3.32c.
Hoops	3.52c.
Bands	3.52c.
Hot-rolled sheets (No. 10)	3.27c.
Hot-rolled ann'd sheets (No. 24)	3.85c.
Galvanized sheets (No. 24)	4.50c.
Long term sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.25c.
Wire, galv. (No. 10)	3.85c.
Tire steel, 1 x 1/2 in. and larger	3.60c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base per keg	\$3.21
	Per Cent
Machine bolts, cut thread:	Off List
Up to 1 in. dia. inclusive	60
Over 1 in. dia.	50
Carriage bolts, cut thread:	
Up to 1/2 in. dia. inclusive	60
Over 1/2 in. dia.	50
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.44c.
Bars, soft steel or iron	3.19c.
Cold-fn. rounds, shafting, screw	
stock	3.74c.
Hot-rolled annealed sheets (No. 24)	4.09c.
Galv. sheets (No. 24)	4.79c.
Hot-rolled sheets (No. 10)	3.29c.
Black corrug. sheets (No. 24)	4.09c.
*Galv. corrug. sheets	4.79c.
Structural rivets	3.99c.
Boiler rivets	4.09c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws,	
fittings up bolts, bolt ends, plug bolts,	
hot-pressed nuts, square and hexagon,	
tapped or blank, semi-finished nuts	
1000 lb. or over	60
200 to 999 lb.	55 and 5
100 to 199 lb.	50 and 5
Less than 100 lb.	50

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	2.95c.
*Structural shapes	2.95c.
*Soft steel bars, small shapes, iron	
bars (except bands)	2.90c.
*Reinforc. steel bars, sq. twisted	
and deformed	2.955c.
Cold-finished steel bars	3.73c.
*Steel hoops	3.40c.
*Steel bands, No. 12 and 3/16 in.,	
incl.	3.15c.
Spring steel	5.00c.
*Hot-rolled anneal. sheets (No. 24)	3.55c.
*Galvanized sheets (No. 24)	4.25c.
*Hot-rolled annealed sheets (No.	
10)	3.05c.
Diam. pat. floor plates, 1/4 in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.
*Base prices subject to deduction on orders aggregating 4000 lb. or over.
†For 50 bundles or over.
‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	*2.10c.
Cold-finished steel bars	3.40c.
Flat-rolled steel under 1/4 in.	3.36c.
Cold-finished strip	3.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide	
sheets	3.56c.
Black ann'd wire, per 100 lb.	\$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per keg	2.40

*Plus mill. size and quantity extras.
†Outside delivery 10c. less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.15c.
New billet reforc. bars	3.25c.
Rail steel reforc. bars	3.25c.
Hoops and bands, 3/16 in. and	
lighter	3.45c.
Cold-finished bars	3.70c.
Hot-rolled annealed sheets (No. 24)	4.09c.
Galv. sheets (No. 24)	4.70c.
Hot-rolled sheets (No. 10)	3.20c.
Structural rivets	3.99c.
Small rivets	55 per cent off list
No. 9 ann'd wire, per 100 lb. (1000	
lb. or over)	\$2.91
Com. wire nails, base per keg (1	
to 24 kegs)	3.50
25 to 50 kegs	3.30
Larger quantities	3.10
Cement c'd nails, base 100-lb. keg	3.50
Chain, 1-in., per 100 lb.	8.25
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	\$19.03
4-in.	44.96
Lap-welded steel boiler tubes, 2-in.	18.10
4-in.	42.32

BUFFALO

	Base per Lb.
Plates	3.37c.
Struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fn. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.39c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Heavy hot-rolled sheets, 3/16 in.,	
24 to 48 in. wide	3.62c.
Galv. sheets (No. 24)	4.65c.
Bands	3.42c.
Hoops	3.42c.
Hot-rolled unannealed sheets	3.17c.
Com. wire nails, base per keg	\$3.35
Black wire, base per 100 lb.	3.45c.

BOSTON

	Per Lb.
Beams, channels, angles, tees, zees	3.52c.
Plates—sheared, tank and univ.	3.52c.*
mill, 1/4 in. thick and heavier	3.52c.*
Floor plates, diamond pattern	5.33c.
Bar and bar shapes (mild steel)	3.30c.
Bands 3/16 in. thick and	
No. 12 ga. incl.	3.60c. to 4.60c.
Half rounds, half ovals, ovals and	
bevels	4.55c.
Tire steel	4.55c.
Cold-finished rounds and hexagons	5.25c.*
Cold-rolled strip steel	3.245c.
Cold-finished squares and flats	5.75c.
Blue annealed sheets, No. 10 gal.	3.60c.
One pass cold-rolled sheets No. 24	
ga.	4.15c.
Galvanized steel sheets, No. 24 ga.	4.85c.
Lead coated sheets, No. 24 ga.	5.80c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.
*Base.

PACIFIC COAST

	San Fran.	Los An.	Seattle
Plates, tank and			
U. M.	3.55c.	3.70c.	3.55c.
Shapes, standard	3.55c.	3.70c.	3.55c.
Soft steel bars	3.60c.	3.70c.	3.55c.
Reinforcing bars	3.50c.	3.50c.	3.50c.
Hot-rolled annealed			
sheets (No. 24)	4.40c.	4.45c.	4.40c.
Hot-rolled sheets			
(No. 10)	3.75c.	3.80c.	3.70c.
Galv. sheets (No.			
24)	5.00c.	5.05c.	5.00c.
Cold finished steel			
Rounds	5.95c.	5.95c.	4.75c.
Squares and			
hexagons	7.20c.	7.20c.	6.00c.
Flats	7.70c.	7.70c.	7.00c.
Common wire nails			
—base per keg			
less carload	\$3.40	\$3.25	\$3.35

All items subject to differentials for quantity.

COMING MEETINGS

OCTOBER

American Society for Metals. Oct. 1 to 5. Technical sessions, Hotel Pennsylvania, New York; exposition, Port Authority Building, New York. W. H. Eisenman, 7016 Euclid Avenue, Cleveland, secretary.

American Institute of Mining and Metallurgical Engineers. Fall meeting of Institute of Metals and Iron and Steel divisions, Hotel Pennsylvania, New York. A. B. Parsons, 29 West Thirty-ninth Street, New York, secretary.

American Welding Society. Oct. 1 to 5. Fall meeting, Hotel New Yorker, New York. M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

American Society of Mechanical Engineers. Oct. 1 to 5. Fall meeting of Iron and Steel division, Hotel Pennsylvania, New York. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

Wire Association. Oct. 1 to 5. Annual meeting, Hotel New Yorker, New York.

Richard E. Brown, 17 East Forty-second Street, New York, secretary.

National Safety Council. Oct. 1 to 5. Twenty-third annual safety congress and exposition, Hotel Statler, Cleveland. W. H. Cameron, 20 Wacker Drive, Chicago, secretary.

National Machine Tool Builders' Association. Oct. 2 and 3. Fall meeting, Hotel Traymore, Atlantic City, N. J. H. H. Lind, 1220 Guarantee Title Building, Cleveland, general manager.

American Gear Manufacturers Association. Oct. 22 and 23. Semi-annual meeting, New Pfister Hotel, Milwaukee. J. C. McQuiston, Penn-Lincoln Hotel, Wilkesburg, Pa., manager-secretary.

American Institute of Steel Construction. Oct. 24 to 26. Twelfth annual convention, Edgewater Beach Hotel, Chicago. V. G. Iden, 200 Madison Avenue, New York, secretary.

American Foundrymen's Association. Oct. 22 to 26. Annual convention and exposition,

Convention Hall, Philadelphia. C. E. Hoyt, 222 West Adams Street, Chicago, executive secretary.

British Duty on Zinc-Coated Sheets Raised

WASHINGTON, Sept. 18—A treasury order, issued under the United Kingdom Import Duties Act and effective Sept. 13, increased the import duty on plain zinc sheets and strip, plates, disks, and circles over 6/1000 in. in thickness, when not plated, coated, drilled, or punched, from 10 per cent ad valorem to 25 per ton, or 15 per cent ad valorem, whichever duty is higher, according to a cablegram received in the Department of Commerce from Commercial Attache Lynn W. Meekins, London.

Zinc Prices Reduced Sharply But Still Fail to Attract Business—Tin Inactive

Copper Buying Still Lags, But Price Is Firm as Users of 95 Per Cent of Domestic Product Sign Code Agreement—Lead Market Quiet With Price Firm

NEW YORK, Sept. 18.—The market remains very dull, and, except for one day when sales rose to about 700 tons, daily bookings in the past week have not averaged much more than 100 tons. The price remains firm at 9c. a lb., delivered Connecticut Valley, and the copper code authority announced yesterday that 92 companies who consume approximately 95 per cent of the copper used in this country have now signed buying agreements which provide for the purchase of only Blue Eagle copper. Temporary agreements under which a few buyers are working have been extended to Oct. 10. August statistics indicate a domestic production from ore of about 18,000 tons of metal and a scrap recovery of about 9000 tons. The total output of 27,000 tons compares with 30,500 tons in July. Foreign mine output and scrap

recovery in August amounted to approximately 86,500 tons, a sharp increase over the 76,500 tons reported in July. This may account in part for the weakness of the European market, which has continued to decline in the last week and is currently quoted at around 6.85c. a lb., c.i.f. usual Continental ports. Even lower prices have been done.

Tin

Sales continue at a low level, with little consumer interest being displayed by large United States users. The price of Straits metal rose slightly last week to a high of 51.70c. a lb. on Friday, but has fallen since to a current quotation of 51.37½c. a lb., the same as on last Tuesday. The operations of tin plate mills continue to hold around the 40 per cent level, but operators' stocks are more than

adequate to meet current and near future demand. Warehouse stocks in the United States declined from 3749 tons on Sept. 8 to 3363 tons on Sept. 15. Tin prices abroad are slightly stronger than they were a week ago, with spot standard quoted at £228 15s. and future standard at £227. In the Far East, Straits metal at Singapore was quoted this morning at £229 5s.

Zinc

Continued lagging demand resulted in further price reductions last week. On Thursday, leading sellers dropped the spelter price five points to 4.10c. a lb., East St. Louis, and as scarcely any buying was attracted, another reduction of 10 points was announced on the following day. The market has since been relatively firm at 4c. a lb., East St. Louis, and 4.35c., New York, but sellers have not been encouraged to enter the market in a significant manner. The present quotations would ordinarily prove attractive, but the business of principal consumers is so unsatisfactory that they hesitate to make future commitments. Sales last week amounted to only about 2000 tons, compared with 1500 tons in the preceding period. The Joplin ore market has not yet reflected the full decline in spelter prices, having declined only \$1 a ton to \$23 for flotation and \$24 for mill grades. Production of concentrates last week amounted to 8400 tons, and, while efforts are being made to renew the recent curtailment agreement, no sharp decline in output is expected this week. August sales of Prime Western by members of the producers' committee, for delivery during that month, totaled 5418 tons at a weighted average price of 4.295c. a lb. For subsequent delivery the same concerns sold 3807 tons at a weighted average price of 4.285c. a lb.

Lead

Sales have not improved, although practically all producers are now meeting the current prices of 3.55c., St. Louis, and 3.70c., New York, at least to contract customers. The September position is now practically booked, but sales have been so light in the past week that October is still not more than 50 to 60 per cent covered. The ore market is unchanged with sales reported to be light. Shipments last week of about 500 tons compared with a production of 900 tons and stocks on Saturday were estimated at 13,850 tons.

Antimony

A price advance last week stimulated the market momentarily, but sales have since fallen off and practically no interest in futures is reported. Chinese metal, 99 per cent, is now quoted at 8.75c., for prompt delivery, compared with 8.62½c. one week ago.

The Week's Prices. Cents Per Pound for Early Delivery

	Sept. 12	Sept. 13	Sept. 14	Sept. 15	Sept. 17	Sept. 18
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, N. Y.	9.12½	9.12½	9.12½	9.12½	9.12½	9.12½
Straits tin, Spot, N. Y.	51.60	51.70	51.50	51.37½	51.37½	51.37½
Zinc, East St. Louis	4.15	4.10	4.00	4.00	4.00	4.00
Zinc, New York	4.50	4.45	4.35	4.35	4.35	4.35
Lead, St. Louis	3.55	3.55	3.55	3.55	3.55	3.55
Lead, New York	3.70	3.70	3.70	3.70	3.70	3.70

*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98-99 per cent, 22.90c. a lb., delivered; new No. 12, 19.50c. a lb., delivered. Aluminum, remelt No. 12 (alloy), carload lots delivered, 14.50c. a lb., average for week. Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered. Antimony, 8.75c. a lb., New York. Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	53.50c. to 54.50c.
Tin, bar	55.50c. to 56.50c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.50c.
*Seamless brass tubes	17.00c.
*Seamless copper tubes	17.25c.
*Brass rods	13.00c.
Zinc, slabs	5.75c. to 6.75c.
Zinc sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.50c.
Antimony, Asiatic	10.00c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ⅓	32.00c. to 33.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	55.25c.
Tin, bar	33.50c.

Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig	4.75c. to 5.00c.
Lead, bar	7.75c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	59.25c.
Solder, ½ and ⅓	33.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.25c.	7.00c.
Copper, hvy. and wire	5.75c.	6.50c.
Copper, light and bottoms	4.87½c.	5.75c.
Brass, heavy	3.12½c.	3.75c.
Brass, light	2.75c.	3.37½c.
Hvy. machine composition	4.75c.	5.25c.
No. 1 yel. brass turnings	4.37½c.	5.12½c.
No. 1 red brass or compos. turnings	4.25c.	5.25c.
Lead, heavy	2.87½c.	3.37½c.
Zinc	2.25c.	3.00c.
Cast aluminum	9.62½c.	10.75c.
Sheet aluminum	11.00c.	12.50c.

Pipe Lines

Northern Natural Gas & Pipe Line Co., Owatonna, Minn., A. F. Traver, engineer, affiliated with Minneapolis Gas Light Co., Minneapolis, has authorized welded steel pipe line from point near Rosemount, Minn., to connection with system of last noted company near Mendota, for natural gas supply at Minneapolis and vicinity. Cost over \$1,500,000.

Empire Gas & Fuel Co., 78 North Main Street, Wellsville, N. Y., plans 4-in. welded steel pipe line from point near Greenwood to connection with system of Hornell Gas Light Co., Hornell, N. Y., about eight miles, for natural gas supply at latter place. Cost over \$50,000.

Peoples Natural Gas Co., 545 William Penn Way, Pittsburgh, plans 6-in. steel pipe line across Conemaugh River at Saltsburg, Pa., replacing present pipe line.

Lone Star Gas Co., Dallas, Tex., proposes to use second-hand 12-in. steel pipe for 75-mile line, to point near Waco, Tex., recently referred to.

Metropolitan Water District, 306 West Third Street, Los Angeles, asks bids until Oct. 3 for about 3.3 miles of welded steel pipe, in connection with conduit and canal construction for Colorado River aqueduct, San Bernardino and Riverside Counties (Specification No. 70).

Kentucky Public Service Co., Sonora, Ky., plans welded steel pipe line from Sonora to Elizabethtown, Ky., and vicinity, for natural gas service.

Cast Iron Pipe

Vergennes, Vt., will close bids Sept. 28 on 35,000 ft. of 10-in. class 150 pipe, 600 ft. of 6-in., and fittings.

Onset, Mass., closed bids Sept. 14 for 7100 ft. of 12-in. class 150 or class B pipe.

Richlands, N. C., asked bids until Sept. 28 for 300 ft. of 8-in., 7800 ft. of 6-in. standard pipe; 7400 ft. of 2-in. and 2500 ft. of 3/4-in. cement-lined pipe for water system; also for 100,000-gal. elevated steel tank and tower, pumping machinery and auxiliary waterworks equipment. William F. Freeman, High Point, N. C., is consulting engineer.

Grayling, Mich., has awarded 225 tons of 4, 6, and 8-in. to James B. Clow & Sons.

Seymour, Wis., has placed 400 tons of 4, 6 and 8-in. with James B. Clow & Sons.

Union Carbide & Carbon Chemical Co., Chicago, has awarded 300 tons of 42-in. to James B. Clow & Sons.

Fox Point, Wis., post office; Milwaukee, will be ready for bids about Oct. 15 on 1000 tons of 16-in. for new water main. C. S. Whitney, 724 East Mason Street, Milwaukee, is consulting engineer.

Checotah, Okla., plans water pipe line extensions. Fund of \$60,000 is being arranged for this and other waterworks expansion. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Blackwell, Okla., plans about five miles for water supply, including approximately 27,000 ft. main 12-in. trunk line. Fund of \$100,000 is being arranged for this and other waterworks extensions. C. A. Stoldt is engineer.

Hayti, Mo., asks bids until Oct. 1 for water pipe line extensions and waterworks improvements. Fund of \$22,800 has been secured through Federal aid. W. A. Fuller Co., 2916 Shenandoah Avenue, St. Louis, is consulting engineer.

Pensacola, Fla., plans 67,000 ft. of 6 to 16-in.; also about 32 tons fittings, and 500,000-gal. capacity elevated steel tank and tower for water system. O. J. Semmes, Jr., city engineer.

Winchester, Ohio, plans water pipe line extensions. Fund of \$47,000 has been arranged



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through Federal aid for this and other waterworks construction. Heer Engineering Co., Terre Haute, Ind., is consulting engineer.

Quindaro Township Committee, Wyandotte County, near Welborn, Kan., closed bids Sept. 21 through Charles A. Haskins & Co., Kansas City, Mo., consulting engineers, for 92,600 ft. of 4 to 8-in. for water line, including about 28 tons fittings.

Tucson, Ariz., plans 3500 ft. of 10-in. to replace present 6-in. water lines in vicinity of Tucson Boulevard. Fund of \$35,000 is being arranged for this and other water pipe improvements.

Marble Falls, Tex., will soon take bids for 2, 6 and 8-in. for water supply system; also for elevated steel tank and tower. Fund of \$43,000 has been arranged for this and other

waterworks construction. H. R. F. Helland, Frost National Bank Building, San Antonio, Tex., is consulting engineer.

Eureka, Cal., will soon take bids for 23-mile water supply line from Mad River to city. Bond issue of \$906,000 for this and construction of dam on river noted has been authorized. Clyde C. Kennedy, Call Building, San Francisco, is consulting engineer.

San Francisco opened bids Sept. 17 on 7000 tons for a high-pressure fire line.

Brawley, Cal., has taken bids on 885 tons of 4 to 14-in.

Sound View Pulp Co., Bellingham, Wash., awarded 100 tons to American Cast Iron Pipe Co.

Fabricated Structural Steel

Awards in Better Volume—New Projects Decline

LETTINGS of 17,650 tons are almost double those of a week ago. Outstanding awards include 5235 tons for the Fisher-Chevrolet assembly plant at Baltimore, 2850 tons for a bridge at Washington, Mo., and 2200 tons for the Lynn-Revere bridge in Massachusetts. New projects of 10,825 tons compare with 16,000 tons last week and 35,750 tons two weeks ago. The bulk of fresh inquiries is for public work and includes 2300 tons for bridges in Missouri and 1200 tons for bridges in Wisconsin. Other new jobs reported are less than 1000 tons each. Plate awards total about 1500 tons. Structural steel lettings for the week follow:

NORTH ATLANTIC STATES

Lynn-Revere, Mass., 2200 tons, bridge, to McClintic-Marshall Corp.

Boston, 300 tons, addition to Robinson Building, to A. O. Wilson Structural Co.

Lynn, Mass., 165 tons, garage roof, to New England Structural Co.

New York, 575 tons, addition to Federal Reserve Bank, to Ingalls Iron Works Co.

Corona, N. Y., 175 tons, State highway project, to McClintic-Marshall Corp.

Pennsylvania Railroad, 670 tons, grade elimination at Elmira, N. Y., to American Bridge Co.

Corning, N. Y., 100 tons, State armory, to McClintic-Marshall Corp.

State of New York, 250 tons, highway bridge in Rensselaer County, to National Bridge Works.

Dunmore, Pa., 245 tons, school and convent, to Weatherley Steel Co.

State of Pennsylvania, 165 tons, highway bridge in Sullivan County, to Lackawanna Steel Construction Co.

Baltimore, 5235 tons, Fisher-Chevrolet assembly building, to Jones & Laughlin Steel Corp.

Hagerstown, Md., 365 tons, Washington County hospital, to McClintic-Marshall Corp.

Hall Station, Md., 265 tons, State highway bridge over Pautuxant River, to Roanoke Bridge & Iron Works.

Anacostia, D. C., 330 tons, high school, to Shippers Car Line Corp.

THE SOUTH

Mobile, Ala., 400 tons, court house and custom house, to McClintic-Marshall Corp.

St. Tammany Parish, La., 150 tons, bridge, to Virginia Bridge & Iron Co.

CENTRAL STATES

State of Ohio, 175 tons, highway bridge in Hocking County, to Burger Iron Co.

State of Ohio, 160 tons, sheet steel piling for Camp Perry, to Carnegie Steel Co.

Evansville, Ind., 190 tons, factory building for Servel Corp., to International Iron & Steel Co.

Austin, Ind., 125 tons, building, to Central States Bridge & Structural Co., Indianapolis.

Battle Creek, Mich., 100 tons, building, to Gage Structural Steel Co.

Chicago, 520 tons, broadcasting station for WGN, to an unnamed fabricator.

Duquoin, Ill., 105 tons, coal washing plant, to an unnamed fabricator.

State of Wisconsin, 225 tons, bridges, to an unnamed fabricator.

State of Wisconsin, 200 tons, bridges, to Wausau Iron Works.

Milwaukee, 125 tons, Hampton Road overhead, to Milwaukee Structural Steel Co.

Washington, Mo., 2850 tons, superstructure for Missouri River bridge, to Stupp Brothers Bridge & Iron Co.

WESTERN STATES

Kemmerer, Wyo., 160 tons, bridge, to Midwest Steel & Iron Works.

Parkin, Utah, 210 tons, Bamberger underpass, to Minneapolis-Moline Power Implement Co.

El Paso County, Colo., 135 tons, State highway structure, to an unnamed bidder.

San Mateo, Cal., 340 tons, school, to Independent Iron Works.

Los Angeles, 185 tons, structure for Bureau of Water and Power, to Western Pipe & Steel Co.

Yosemite, Cal., 150 tons, utilities building, to Golden Gate Iron Works.

Selby, Cal., 250 tons, building, to Minneapolis-Moline Power Implement Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Lawrence, Mass., 800 tons, County bridge.

Springfield, Mass., 400 tons, Federal Land Bank building.

Borough of Queens, N. Y., 340 tons, additions and alterations to Bergen Landing and Betts Avenue destructor plants.

Hampton, Hunterdon County, N. J., 245 tons, State highway bridge.

Scranton, Pa., 400 tons, two State underpasses.

Edge Moor, Del., 900 tons, plan for Krebs Pigment & Color Corp.; bids to be asked soon.

THE SOUTH

Moore Haven, Fla., 450 tons, lock.

CENTRAL STATES

Toledo, 800 tons, car dumper for Chesapeake & Ohio Railroad.

Wood River, Ill., 150 tons, building for Sheel Petroleum Co.

Trempealeau, Wis., 1000 tons, bridges and tainter gates, Government Dam No. 6, Mississippi River; bids Oct. 2.

State of Wisconsin, 1200 tons, bridges.

Herford Junction, Wis., 100 tons, bridge for Soo Line.

State of Minnesota, 550 tons, bridges.

State of Missouri, 2300 tons, highway bridges; including Jackson County, 1400 tons; Oregon County, 185 tons; Texas County, 100 tons, and Butler County, 150 tons; bids to be opened Sept. 28.

St. Louis, 200 tons, Hampton Avenue viaduct; bids to be opened Oct. 9 by Board of Public Service.

Keystone, Neb., 925 tons, bridge.

WESTERN STATES

Thompson Falls, Mont., 225 tons, bridge.

State of Montana, 454 tons, highway bridges in Yellowstone and Silver Bow Counties; bids Sept. 21.

Eagle County, Colo., 275 tons, State overhead crossing; bids Sept. 25.

Los Angeles, 100 tons, plant for Rio Grande Oil Co.; bids under advisement.

FABRICATED PLATE

AWARDS

Carney's Point, N. J., 150 tons, tanks, to Western Gas & Construction Co.

Rochester, N. Y., 215 tons, elevated tank, to Pittsburgh-Des Moines Steel Co.

Grand Rapids, Mich., 140 tons, elevated tank, to Pittsburgh-Des Moines Steel Co.

Duquoin, Ill., 150 tons, tanks, to Western Gas & Construction Co.

Pineview Project, Utah, 675 tons, to Alco Products Co.

Magic, Idaho, 175 tons, steel pipe and gates, to Babcock & Wilcox Co.

NEW PROJECTS

Vergennes, Vt., 100 tons, water tank.

Seymour, Wis., 100 tons, steel tank for new waterworks system, Chicago Bridge & Iron Works, low bidder.

St. Louis, 150 tons, 10 steel pontoons for United States Engineer's office; bids to be opened Sept. 21.

Los Angeles, 290 tons, 22-in. black welded pipe for Metropolitan Water District; bids taken Sept. 18.

Reinforcing Steel

Awards 2850 Tons—New Projects 2965 Tons

Revere, Mass., 400 tons, bridge, to Kalman Steel Corp.

Waverley, Mass., 150 tons, State hospital, to Concrete Steel Co.

Jamaica, N. Y., 250 tons, inspection shed for Board of Transportation, to Joseph T. Ryerson & Son, Inc.

State of New York, 975 tons, mesh, road work in Schenectady, Jefferson, Fulton, Onondaga, Oneida and Lewis counties, to American Steel & Wire Co.

Washington, Mo., 160 tons, superstructure, Missouri River bridge, to Stupp Brother Bridge & Iron Co.

Washington, Mo., 165 tons, substructure, Missouri River bridge, to Missouri Valley Bridge & Iron Co.

Long Beach, Cal., 200 tons, Santa Cruz Cement Co. distributing plant, to Graham Brothers.

Long Beach, Cal., 160 tons, reconstruction of high school, to Concrete Engineering Co.

Torrance, Cal., 120 tons, reconstruction of high school, to Soule Steel Co.

San Bernardino County, Cal., 140 tons, State storm drain, to Soule Steel Co.

Shafter, Cal., 120 tons, school, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Elmira, N. Y., 200 tons, addition to State school.

Buffalo, 400 tons, Kensington high school.

Reading, Pa., 500 tons, high school; McClosky & Co., low bidders.

Reading, Pa., 165 tons, grade school; Consolidated Engineering Co., Baltimore, general contractor.

Chicago, 300 tons, Sanitary District; bids to be taken Sept. 20.

Trempealeau, Wis., 300 tons, Government Dam No. 6, Mississippi River; bids Oct. 2.

St. Louis, 1000 tons, Hampton Avenue viaduct; bids to be opened Oct. 9 by Board of Public Service.

State of Colorado, 178 tons, highway structures in Pueblo and Eagle counties; bids Sept. 25.

Norwalk, Cal., 107 tons, school; general contract awarded.

Carlsbad, Cal., 115 tons, State bridge across Escondido Creek; general contract awarded.

▲▲ OBITUARY ▲▲

EDWIN J. BEST, who held responsible engineering positions with leading steel plants and engineering equipment companies, died Sept. 12 at New London, Ohio, aged 60 years. Early in his career he was identified with the Garrett-Cromwell Engineering Co., and then became chief engineer successively of the Illinois Steel Co. at South Chicago and the Tennessee Coal, Iron & Railroad Co. at Birmingham. In 1912, he joined the one-time Cleveland Machine & Mfg. Co., and since then served the Algoma Steel Co., at Sault Ste. Marie as chief engineer and later again went to Birmingham for the Tennessee company and also the Woodward Iron Co. Recently he was a member of the Russian staff of the Freyn Engineering Co.

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JAMES R. ROE, who was in the research department of the Reading Iron Co., Reading, Pa., died at his home in Douglasville, Pa., on Sept. 13, aged 75 years. Mr. Roe was the inventor of the Roe iron puddler and boiler specialties. For many years he was general manager of the Glasgow Iron Co., Pottstown, Pa., and later went with the Reading Iron Co. as general superintendent. Mr. Roe also was known for important technical papers he presented before the American Iron and Steel Institute.

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E. A. BONNER, purchasing agent, South Chester Tube Co., Chester, Pa., died suddenly, Sept. 15, at a hospital in that city. Mr. Bonner was identified with the South Chester company for about 30 years.

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EDWARD A. LANGENBACH, chairman of the former United Alloy Steel Corp., Canton, now a part of the Republic Steel Corp., and long identified with the sheet, tin plate and alloy steel industry in the Canton district, died at his summer home at Congress Lake, near Canton, Sept. 8, after a long illness, aged 70 years. He was one of the founders in 1887 of the Berger Mfg. Co., which in 1906 was incorporated and took over the Stark Rolling Mill Co., Canton, Mr. Langenbach being its president and general manager. When the Carnahan Tin Plate & Steel Co. was organized in 1900 he became its secretary and in 1903 he became manager of the newly organized United Steel Co. The Berger company became the United Alloy Steel Corp. in 1916 with Mr. Langenbach as its chairman, and this company later absorbed the United Steel Co., the United Furnace Co., the Alloy Division, the Berger Co., and the South Side Division of the Canton Sheet Steel Co. In 1926 the United Alloy Steel Corp. merged with the Central Steel Co. and Central Fur-

NON-SHRINK, OIL HARDENING TOOL STEEL TUBING



The job of making ring dies, cutting dies, bushings spacers, etc., is half done when you start with Bissett Tool Steel Tubing. There is a size carried in stock to meet every requirement up to 12" O.D. and 2" wall thickness. Larger sizes can be supplied.

It eliminates forging, does away with annealing difficulties and cuts down machining cost.

We also supply special tubing to S.A.E. 52100 and S.A.E. 4615 analysis for Ball Bearing purposes.

Manufacturers of BISCO Tungsten Carbide and Tantalum Carbide drawing dies for wire, rod and tubing.

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Cincinnati

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nace Co. of Massillon into the Central Alloy Steel Corp., and Mr. Langenbach retired from active connection with the new organization.

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EDWIN C. REEDER, superintendent and general manager, Hillside Fluor Spar Co. properties in Southern Illinois and Kentucky, died as the result of an automobile accident at Waupun, Wis., on Aug. 23, aged 53 years. He was graduated from the Michigan College of Mines in 1901 and had been identified with the fluorspar industry for the past 18 years. Mr. Reeder was a member of the American Institute of Mining and Metallurgical Engineers and of the Lake Superior Mining Institute.

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A. D. CHANDLER, sales engineer for Aluminum Industries, Inc., Cincinnati, died at Kennett Square, Pa., on Sept. 4 after a long illness.

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CARL E. LOYSTER, for 25 years designing engineer for the Globe Steel Tubes Co., Milwaukee, died after a week's illness on Aug. 17, aged 50 years. After receiving his engineering education at the University of Michigan, he became associated with the Alamo Gas Engine Co. He spent a few years as a designer of ventilating equipment and in 1910 became identified with the newly founded Globe Seamless Steel Tubes Co., of which he was appointed mechanical engineer.

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NATHAN ALBERT FITCH, for years superintendent of the Grant Gear Works, South Boston, died on Sept. 9, at Cedar Grove, Me.

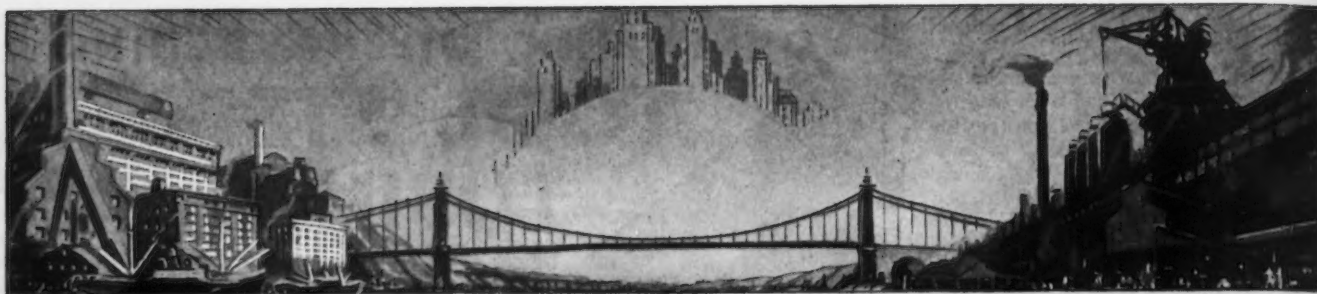
Public Work Main Source Of Business at St. Louis

ST. LOUIS, Sept. 18.—State and Federal projects continue to provide what business steel mills have in prospect. The Missouri Highway Commission will open bids Sept. 28 for bridges that will require 2300 tons of structural steel. The local Board of Public Service will open bids Oct. 9 for the Hampton Avenue viaduct, involving 1000 tons of reinforcing bars and 200 tons of structural steel. The United States Engineer's office has called for bids on Sept. 21 for ten pontoons, which will utilize 150 tons of plates.

Fourth quarter pig iron prices in this district have been established at \$18.50, base, Granite City, the same level that prevailed in the preceding quarter. There has been some pick-up in the melt of gray iron foundries and stove plants, and there has been an increase in spot business in pig iron. September shipments are expected to be double those in August.

Business in scrap is at a standstill, but dealers are confident that the mills will enter the market within the next two or three weeks, and believe that most of them would be now were it not for the textile strike. Cast iron borings, machine shop turnings and No. 1 railroad wrought have been marked down 50c. a ton.

Chain Belt Co., Milwaukee, has appointed Rapp & Hollins, Inc., Chicago, as the exclusive agent in northern Indiana, northern Illinois, eastern Iowa and southern Wisconsin, for Rex sand handling equipment, Rex mold conveyors, Rex casting conveyors, and other Rex foundry equipment.



PLANT EXPANSION AND EQUIPMENT BUYING

Machine Tool Outlook Breeds No Optimism

THE machine tool market is still characterized by the spottiness that it has exhibited for the past few months. Expectation of large replacement orders for several automotive concerns, which has already resulted in some sizable orders, has been dimmed recently by delays in deciding upon 1935 models.

Makers in the Cleveland district

have been somewhat encouraged this week by an improvement in inquiry, mainly for single machines, but orders are still slow in coming out. In the Chicago area there is considerable pessimism with regard to the outlook. Millers and grinders seem to be in better demand this week in the Cincinnati area with the market moving slightly ahead of last week in rate of activity.

◀ NORTH ATLANTIC ▶

Colonial Beacon Oil Co., Inc., 155 East Forty-second Street, New York, has filed plans for extensions and improvements in bulk oil storage and distribution plant on Greenman Street, Brooklyn. C. F. Paul is company architect. Cost about \$65,000 with equipment.

Fleetwings, Inc., Roosevelt Field, Garden City, N. Y., manufacturer of stainless steel aircraft, plans early removal of plant to former works of Keystone Aircraft Corp., Bristol, Pa., on 31-acre tract recently purchased, for increased parts production and assembling.

Cole Fabricating Corp., Peekskill, N. Y., has been organized by Edward J. Cole, 946 Paulding Street, and Frank A. Burchetta, 652 Belden Street, capital \$400,000, to manufacture bolts, nuts, screws and kindred products.

Signal Supply Officer, Army Base, Brooklyn, asks bids until Sept. 24 for 41,900 ft. telephone cable (Proposal 24); until Sept. 28, radio equipment and parts (Proposal 21).

Board of Education, Lawrence, L. I., plans manual training department in new two-story high school, for which bids are being asked on general contract. Cost \$825,000. Fund has been arranged through Federal aid. L. J. Lincoln is architect for board.

Todd Shipyards Corp., 25 Broadway, New York, has organized subsidiary under name of Todd-Galveston Drydocks, Inc., to take over former plant of Galveston Drydock & Construction Co., Galveston, Tex., recently acquired, and will operate as branch shipbuilding and repair works in conjunction with present Southern plants at New Orleans and Mobile, Ala. New 10,000-ton drydock will be built at Galveston, duplicating existing drydock of same size, with additional shop and equipment facilities. John D. Reilly is president of both organizations.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 25 for two motor-driven milling machines and spare parts (Schedule 3296), steering gears, windlasses and spare parts (Schedule 3245) for Brooklyn and Charleston, S. C., navy

yards; until Sept. 28, for five 1000-lb., two 500-lb., and 60 420-lb. weighing scales (Schedule 3317) for Brooklyn, Philadelphia, Sewall's Point, Puget Sound and Mare Island yards.

State Department of Correction, State Office Building, Albany, N. Y., will soon begin construction of new State vocational school at Cossackie, N. Y. Cost close to \$200,000 with equipment.

Board of Education, Park Avenue and Fifty-ninth Street, New York, will soon take bids on general contract for new multi-story high school at Tottenville, S. I. Manual training department will be installed. Cost \$976,900. Fund has been secured through Federal aid. W. C. Martin, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect for board.

Department of Correction, Municipal Building, New York, plans installation of power house and mechanical shops in city jail on 158th Street, near Gerard Avenue, Bronx, for which bids will soon be asked on general contract. Fund of \$989,200 has been arranged through Federal aid for project.

Standard Combustion Corp. of New Jersey, Jersey City, N. J., has been organized by Edward O. Benjamin, 212 Johnson Avenue, and associates, to manufacture heating and refrigeration equipment.

Department of Institutions and Agencies, State Office Building, Trenton, N. J., William J. Ellis, commissioner, asks bids until Oct. 2 for new structures at State Prison Farm, Bordentown, N. J., including power plant with Diesel engine-generators and auxiliaries, boilers and accessories, oil burners and oil-burning equipment, etc.; also for water plant and system, including elevated steel tank and tower, water-treating equipment, pipe lines, etc.; underground pipe line system for steam distribution. Division of Architecture and Construction, address noted, is architect and engineer.

Resinous Products & Chemical Co., 222 West Washington Square, Philadelphia, manufacturer of industrial chemicals, etc., has let general contract to F. V. Warren Co., Fifteenth and Locust Streets, for new two-story plant. Cost about \$70,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 25 for 400 regulating suction valves (Schedule 3332), 300 aircraft inclinometers (Schedule 3314), 300 engine gage aircraft units (Schedule 3312), one 5-ton gasoline engine-driven tandem road roller (Schedule 3372), 350 aircraft thermometers (Schedule 3313), 200 aircraft manifold pressure gages (Schedule 3308); until Sept. 28, 850 electric storage batteries (Schedule 3336) for Philadelphia Navy Yard.

◀ NEW ENGLAND ▶

Wire Novelty Co., 680 Third Avenue, West Haven, Conn., manufacturer of wire goods, has let general contract to J. N. Leonard Co., 902 Chapel Street, New Haven, Conn., for one-story addition, 47 x 95 ft. Jacob Weinstein, New Haven, is architect.

Crompton & Knowles Loom Works, 93 Grand Street, Worcester, Mass., manufacturer of textile machinery and parts, has plans for extensions and improvements in power house, including new equipment. Francis J. Sill, East Main Street, Westboro, Mass., is consulting engineer.

Chrome & Nickel Stove Pipe Mfg. Co., Hartford, Conn., has been organized by Michael Krichavsky, 69 Sargeant Street, and Martus S. Rogal, 242 Westland Street, to manufacture heating specialties, special pipe, etc.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 28 for one machine for tension-compression tests on metals, and one automatic stress-strain recorder (Schedule 3361) for Newport, R. I., Navy Yard.

Gondek-Dixon Corp., Somerville, Mass., has been organized by John T. Gondek and Daniel L. Dixon, 357 Mystic Avenue, to manufacture electric machinery and parts.

Electrolux, Inc., 500 Fifth Avenue, New York, manufacturer of vacuum cleaners, parts, etc., has asked bids on general contract for one-story addition to plant at Old Greenwich, Conn., 86 x 135 ft., primarily for storage and distribution. H. K. Ferguson Co., Hanna Building, Cleveland, is architect and engineer.

◀ OHIO AND INDIANA ▶

Bacchus Wine Co., Madison, Ohio, has acquired former plant of William Edwards Co., and will remodel for new winery. Cost over \$45,000 with machinery.

Early & Daniel Co., Chamber of Commerce Building, Cincinnati, will take bids at once for new grain elevator to replace unit recently destroyed by fire. Cost about \$125,000 with elevating, conveying, screening and other equipment. Horner & Wyatt, Board of Trade Building, Kansas City, Mo., are engineers.

Erb Machinery & Mfg. Co., Youngstown, Ohio, has been organized by C. F. and Robert P. Erb, care of W. G. Dornan, Dollar Bank Building, representative, to manufacture machinery and parts. Same interests have also formed Erb Heating & Air-Conditioning Co., to manufacture heating equipment, air-conditioning machinery and kindred equipment.

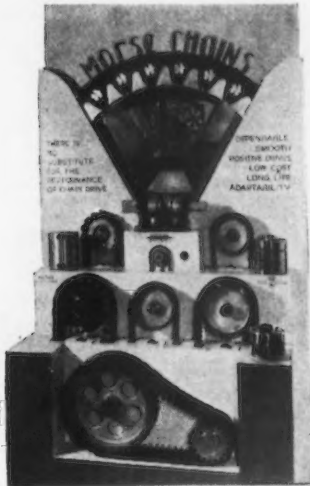
Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Sept. 24 for 125 station altimeter housing assemblies (Circular 106); until Sept. 28, 22 four-blade test club assemblies and 10 two-blade test club assemblies (Circular 95); until Oct. 5, 100 aircraft engine cylinder spray equipment (Circular 104), three hull assemblies (Circular 103); until Oct. 8, one 15-ton and one 5-ton electric-operated cranes (Circular 108), 162 assembly-bank and turn type indicators and

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POWER TRANSMISSION NEWS

In all their shining glory you will find Morse silent and roller chains, clutches and Morflex couplings on display and in action at the Century of Progress in Chicago.

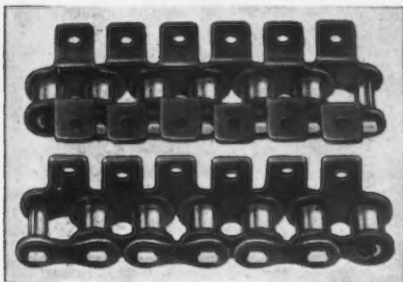
Light and action and working demonstrations all contribute to the interest of this elaborate exhibit, which is part of the complete Borg-Warner display.



We believe that, like thousands of others, you will feel that a visit of inspection to this display will be well worth your while. Be our guest.

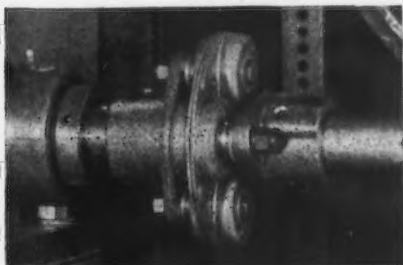
Roller Chains Standard Attachments

For use as conveyors, Morse Roller Chains are equipped with standard attachments which can be fitted to either side of the chain, or both sides.



Morflex Couplings

Shock and vibration, angular and parallel misalignments of shafts are "meat" for



the Morflex coupling, developed by the Morse Chain Co., Ithaca, N. Y.

The secret of its extreme flexibility without power loss is the especially developed, resilient, non-cold-flow, live rubber blocks. They have great resistance to deterioration. Because of the absence of friction and heat generation, tests have shown negligible power loss in this coupling.

The floating center reduces the effect of angular or parallel misalignment and the live rubber cushions uneven impulses, sudden reversal and vibration.

Add to these advantages the facts that no lubrication is ever required, no protec-

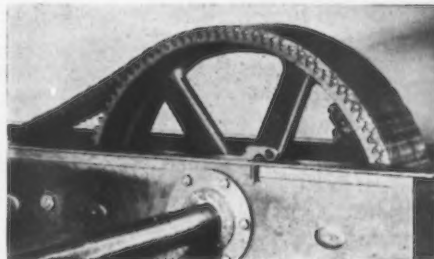
tion is needed against dirt, grit, water or weather, that there is no wear, no noise, no back lash, low cost, and you have many good reasons for its tremendous success in a multitude of services.

The Morse Morflex coupling, to be absolutely frank with you, simplifies the problem of 100% power transmission where shaft misalignment is encountered. There are many bores immediately available for use.

Morflex couplings with bores from $\frac{3}{8}$ " to $2\frac{1}{4}$ " are carried in stock.

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WE WILL PAY THE PERSON SENDING
A PHOTO OF THE OLDEST MORSE
CHAIN IN OPERATION **\$25⁰⁰**



We are continually hearing about Morse Silent Chains that have been in satisfactory

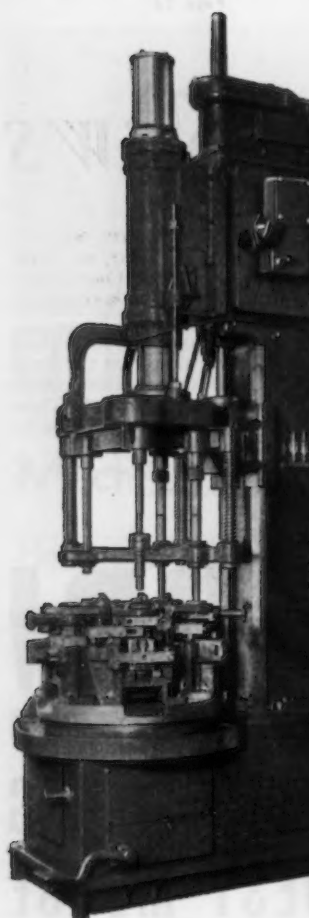
operation for upwards of twenty years.

We want to find the oldest one, and we are willing to pay for it. Perhaps you have a Morse Chain in your plant that would qualify. Send along a picture of the installation. If it's the oldest we receive, you will get a check for \$25.00. Write a short statement about the work it performs.

MORSE CHAIN COMPANY

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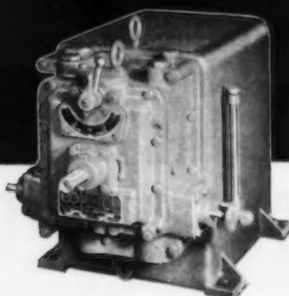
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For Speed Variations Under Temperature and Working Conditions

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Big New Book.
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● Above: The Barnes drill, Oilgear Fluid Power Feed equipped, back of the door in the head.

DESIGNERS seeking vastly improved functioning—sales departments eager for winning features—users hunting speed and economy—will get the facts now on Oilgear's revolutionary Fluid Power Feeds.

At right, a new Oilgear Fluid Power Feed. Note: Flanged mounting, as integral machine part . . . Inside pump, eliminating hazard and bettering appearance . . . Self-contained; auxiliary valves, tubing are integral with pump. Many other exclusive features. The OILGEAR Company, 1311 W. Bruce St., Milwaukee, Wis.



OILGEAR FLUID POWER FEEDS

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120 rate of climb indicators (Circular 109), 438 pneumatic raft assemblies (Circular 111).

Village Council, Richwood, Ohio, plans installation of 100,000-gal. elevated steel tank and tower, water-treating plant, pumping station, pipe lines, etc., for municipal waterworks. Fund of \$80,000 has been arranged through Federal aid.

Utilities Truck Equipment Corp., Cleveland, has been organized by V. E. Johns and F. R. Fortune, care of Harold E. Foster, 1216 Citizens Building, representative, to manufacture motor truck equipment.

Arup Mfg. Co., South Bend, Ind., manufacturer of new type of flying-wing airplanes and parts, has leased property at 1428 East Nineteenth Street, Indianapolis, for new plant. South Bend works are being transferred to new location and capacity will be increased. Ralph R. Graichen, vice-president and chief engineer, will be in charge of plant operations.

Landum Corp., 333½ Ohio Street, Terre Haute, Ind., has been organized by Raymond C. Lanning and Kenneth A. Duncan, 1401 South Seventh Street, to manufacture mechanical and electrical appliances and equipment.

Board of Public Works, Evansville, Ind., plans installation of pumping equipment, sludge machinery, digesters, loaders and other mechanical equipment in new sewage disposal works and system. Fund of \$1,175,000 has been arranged for project. Greeley & Hanson, 6 North Michigan Avenue, Chicago, are consulting engineers.

◀ BUFFALO DISTRICT ▶

Arrow Head Steel Products Co., 180 Hopkins Street, Buffalo, manufacturer of automotive equipment, including pistons, wrist pins, shackle bolts, etc., with main plant at Minneapolis, has leased about 5000 sq. ft. in build-

ing at 779 Michigan Avenue for new factory branch, storage and distributing plant.

New York Utilities, Inc., Greig, N. Y., plans new electric power substation, transmission and distributing lines for service in vicinity of Greig. Cost over \$65,000 with equipment.

Acme Gear & Drill Co., Ltd., Toronto, Ont., is concluding arrangements for acquisition of local plant of Willys-Overland, Ltd., manufacturer of automobiles, parts, etc., from receivers of parent company, Willys-Overland Co., Toledo, Ohio, for new works.

Noranda Power Co., Ltd., recently organized subsidiary of Noranda Mines, Ltd., Royal Bank Building, Toronto, Ont., plans new hydroelectric power plant on Victoria River for service at gold-mining properties of parent company. Cost over \$350,000 with transmission line. Fred A. Gaby, Toronto, formerly chief engineer for Ontario Hydro-Electric Power Commission, is consulting engineer.

◀ SOUTH ATLANTIC ▶

Town Council, Bethune, S. C., asks bids until Sept. 26 for one 75,000-gal. capacity tank and tower, deep-well pumping machinery and accessory equipment, hydrants, valves, meters, pipe lines, etc., for municipal waterworks. Ryan Engineering Co., Arcade Building, Columbia, S. C., is consulting engineer.

Santee-Cooper Authority, care of Mayor Burnet Maybank, Charleston, S. C., chairman, plans hydroelectric power development on Santee and Cooper Rivers in southern part of State, including two reservoirs, hydroelectric generating plant of 200,000-hp. capacity near Pinopolis, power substations and switching stations, and 475 miles of transmission line to serve coastal district of State. Cost \$25,000,000. Financing will be arranged through Federal aid. Murray & Flood, 369 Lexington Avenue, and Foundation Co., 120 Liberty Street, both New York engineers, have submitted tentative plans for project.

Colonial Oil Co., Savannah Bank & Trust Co. Building, Savannah, Ga., plans new bulk oil storage and distributing plant on Savannah River, with steel tanks for initial capacity of about 100,000 bbl. Project will include new wharf, 150 ft., to accommodate tankers for oil supply. Cost over \$90,000 with equipment.

Town Council, Pinewood, S. C., asks bids until Sept. 25 for 75,000-gal. capacity elevated tank on 100-ft. tower, deep-well pumping machinery and accessories, valves, meters, pipe lines, etc., for municipal waterworks. Ryan Engineering Co., Arcade Building, Columbus, S. C., is consulting engineer.

◀ WESTERN PENNA. ▶

Pittsburgh & Lake Erie Railroad Co., P. & L. E. Terminal Building, Pittsburgh, J. H. James, room 222, purchasing agent, asks bids until Sept. 27 for 1934 fourth quarter requirements of car and locomotive axles, and tubes (Serial Contract No. 3, 1934).

American Cyanamid & Chemical Co., Latrobe, Pa., plans early rebuilding of part of plant recently destroyed by fire. Loss about \$50,000 with equipment.

United States Engineer Office, Pittsburgh, plans hydroelectric generating plant at new Tygart Valley reservoir dam on Monongahela River, near Grafton, W. Va., including transmission lines, substations and distribution lines. Cost over \$2,000,000. Entire project will cost close to \$12,000,000.

Appalachian Electric Power Co., Roanoke, Va., plans aerial transmission line, suspended by steel towers, across Kanawha River, near Nitro, W. Va. Application has been made for Federal permission.

◀ SOUTH CENTRAL ▶

Director of Purchases, Tennessee Valley Authority, New Sprinkle Building, Knoxville, Tenn., asks bids until Sept. 25 for one to five gasoline-driven, crawler-type dragline cranes and ¾-yd. capacity buckets, each crane with 25-ft. boom, 5-ft. straight extension for boom and 500 ft. improved plow-steel cable; until Sept. 26, 100 miles hard-drawn copper conductor with splicing sleeves, about 1000 armor rod sets complete, and 50 dead-end clamps for conductor.

Plough, Inc., Memphis, Tenn., manufacturer of chemical products, has plans for new plant with main multi-story unit and smaller structures. Cost about \$350,000 with equipment. Company has recently arranged for increase in capital by \$1,836,000, part of proceeds to be used for this and other expansion.



FLAT SPRINGS



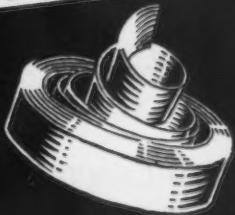
TORSION SPRINGS



COMPRESSION SPRINGS



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**Barnes-made
SPRINGS**

THE WALLACE BARNES COMPANY, BRISTOL, CONN.

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- **TIME . . .** by using Johnson **UNIVERSAL** Completely Machined Bronze Bars. Only a 1/64" cut is necessary to bring to finished bearing size. OD is always concentric with ID.
- **MONEY . . .** 25% less weight as compared to Rough Bars. Savings in tools and labor.
- **AVOID** costly delays . . . because imperfections usually tie-up both machines and men. Complete machining eliminates all blow-holes, porosity, scale and undersurface defects. ID is broached, Ends machined squared.
- **GENERAL PURPOSE BUSHINGS . . .** available in over 600 sizes . . . machine finished . . . ready for assembly . . . stocked in principal industrial centers.
- **THE ALLOY**—Copper 80, Tin 10, Lead 10, used in Johnson **UNIVERSAL** Bars and General Purpose Bushings **HAS NO EQUAL AS A GENERAL PURPOSE BEARING BRONZE.**

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JOHNSON BRONZE

Factory and General Offices

New Castle, Pa.

Branch Offices and Warehouses

in Principal Cities

Town Council, Eddyville, Ky., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for municipal waterworks. Fund of \$40,000 has been secured through Federal aid. J. S. Watkins, Lexington, Ky., is consulting engineer.

Common Council, Logansport, La., plans installation of elevated steel tank and tower, deep-well pumping machinery and accessories, pipe lines, etc., for municipal waterworks. Charles D. Evans, Shreveport, La., is consulting engineer.

◀ SOUTHWEST ▶

United States Engineer Office, Postal Telegraph Building, Kansas City, Mo., asks bids until Sept. 24 for one air compressor, one brake lining machine, four vises, four steel creepers, two blow torches, anvil, clamps and other equipment (Circular 116).

Carter Carburetor Corp., 2838 North Spring Street, St. Louis, will soon break ground for one-story addition, for which general contract recently was let to Fruin-Colnon Contracting Co., Merchants Laclede Building. Cost about \$45,000. Company plans four-story addition later, to cost close to \$100,000 with equipment.

Zimmerman Electric Co., 1815 East Central Avenue, Wichita, Kan., manufacturer of electrical equipment, has let general contract to S. S. Westvold, 306 South Volusia Street, for one-story addition, 40 x 80 ft.

Board of Education, Library Building, Kansas City, Kan., will take bids on general contract in 60 to 90 days for new three-story and basement high school, 372 x 650 ft., at Twenty-second Street and Minnesota Avenue. Manual training department will be installed; also power house and other mechanical departments. Cost \$1,800,000 with equipment. Hamilton, Fellows & Nedved, 814 North Tower Court, Chicago, are architects; Joseph W. Radotinsky, Commercial National Bank Building, Kansas City, Kan., is associate architect.

Humble Oil & Refining Co., Houston, Tex., has work under way on extensions in refinery at Baytown, Tex., including new refining, processing and other machinery. Additional stor-

age and distribution facilities will be provided. H. C. Weiss is executive vice-president.

Board of Directors, Fred Douglass National Tubercular Hospital for Negroes, El Paso, Tex.; care of Percy W. McGhee, El Paso, architect, plans steam-electric generating plant at proposed new institutional buildings near city, with Diesel engine-generators and auxiliary equipment; also elevated steel storage tank, 150,000-gal. capacity, and tower, for water supply, pumping station, refrigerating plant, machine shop and other mechanical departments. Entire project will cost about \$2,500,000. Financing will be arranged through Federal aid. L. W. Washington, El Paso, is secretary and treasurer.

◀ MIDDLE WEST ▶

Samuel Bingham's Son Mfg. Co., 636 Sherman Street, Chicago, manufacturer of printers' rollers and allied equipment, has plans for rebuilding part of plant recently destroyed by fire. Cost about \$50,000 with equipment. Nimmons, Carr & Wright, 333 North Michigan Avenue, are architects.

United States Engineer Office, Canal and Van Buren Streets, Chicago, asks bids until Sept. 26 for one-story steel building, including steel frame, galvanized steel sheets and complete auxiliary equipment (Circular 24).

City Council, St. Cloud, Minn., has called special election on Oct. 2 to approve proposition for new municipal electric light and power plant and distribution system. Cost about \$1,249,000 with equipment. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Board of Education, Ames, Iowa, plans manual training department in new two-story and basement high school. Cost about \$250,000. Bids will be asked on general contract soon. Tinsley, McBroom & Higgins, Hubbell Building, Des Moines, Iowa, are architects.

Borg-Warner Corp., 310 South Michigan Avenue, Chicago, manufacturer of automobile parts and equipment, has acquired Detroit Vapor Stove Co., 12345 Kercheval Avenue, Detroit, manufacturer of domestic heating equip-

ment, parts, etc., and will operate as subsidiary.

Seeger Refrigerator Co., 850 Arcade Street, St. Paul, Minn., manufacturer of refrigerators, parts, etc., has plans for two one-story additions, 83 x 200 ft., and 44 x 200 ft., latter to be used for expansion in metal-working division. Cost over \$75,000 with equipment. C. H. Johnston, 360 Robert Street, is architect.

Bureau of Reclamation, Denver, asks bids until Oct. 1 for one direct pumping unit and auxiliary equipment.

Montana Lead, Inc., Power Building, Helena, Mont., care of Philip Barbour, president, address noted, plans new flotation mill at mining properties near Rimini, Mont. Committee of City Council of last noted place is arranging for site. Cost over \$45,000 with machinery.

Public Utilities Commission, Manitowoc, Wis., closes bids Sept. 27 for one 5000-kw. steam turbo-generator, condenser and auxiliary equipment for municipal power plant.

Midwest Stamping & Enameling Co., Morrison, Ill., recently organized, has purchased factory formerly occupied by steel box division of Illinois Refrigerator Co., Morrison, for manufacture of sheet metal stampings and sheet steel porcelain enamel refrigerator parts. Plant has 65,000 sq. ft. of floor space and is equipped to manufacture steel refrigerator cabinets, with facilities for forming, stamping, welding, assembling, lacquering, painting and porcelain enameling. S. S. Battles, chief engineer of Ingersoll Steel & Disc Co., Chicago, is president and treasurer; George Green is superintendent.

◀ WASHINGTON DISTRICT ▶

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until Sept. 24 for lathe, electric drill, hydraulic press, bar machine, drills, wrenches, oil power hydraulic jacks, compressors, pliers, hacksaw blades, screwdrivers, work benches, galvanized funnels, etc. (Circular 37).

Globe Brewing & Mfg. Co., 327 South Hanover Street, Baltimore, is asking bids on general contract for four-story and basement addition, 21 x 72 ft. Cost over \$70,000 with equipment. Herbert Aiken, 4115 Ridgewood Road, is architect.

Division of Purchases and Sales, Department of Commerce, Washington, asks bids until Sept. 25 for overhauling and repairing airplane engines as required during period ending June 30 (Proposals 26416-26419, inclusive, and 26422).

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Sept. 26 for oil burner equipment for greenhouse. Naval Academy, Annapolis, Md. (Specification 7782).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Sept. 25 for motor-driven combination grinder and buffer, pedestal type (Schedule 3310) for Eastern or Western Navy Yard.

◀ MICHIGAN DISTRICT ▶

Briggs Mfg. Co., 11631 Mack Avenue, Detroit, manufacturer of steel automobile bodies, steel sinks, etc., will carry out expansion in press department and metal enameling division, including new equipment for production of drawn metal plumbing fixtures, bathtubs and other specialties. Work is being started on a one-story addition, 200 x 300 ft., for press department. Entire project will cost over \$750,000 with equipment. Giffels & Vallet, Inc., Marquette Building, is architect.

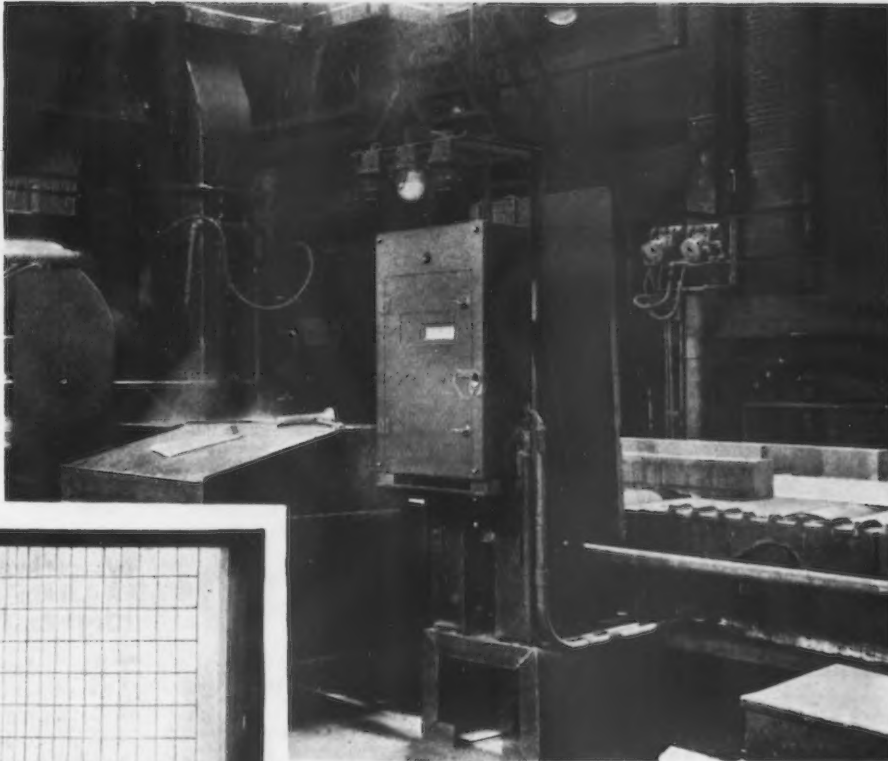
American Brakebloec Corp., 4660 Merritt Avenue, Detroit, manufacturer of automotive equipment, has let general contract to Austin Co. for two-story addition. Cost close to \$45,000 with machinery. Company is a subsidiary of American Brake Shoe & Foundry Co., New York.

Voigt Brewing Co., Ferndale, Mich., has let general contract to Stibbard Construction Co., 3000 Grand River Avenue, Detroit, for extensions in former baking plant on Ten Mile Road, to be converted for brewery, with storage and distribution building, power house, machine shop and other units. Cost close to \$100,000 with machinery. G. A. Mueller, 1346 Broadway, Detroit, is architect and engineer.

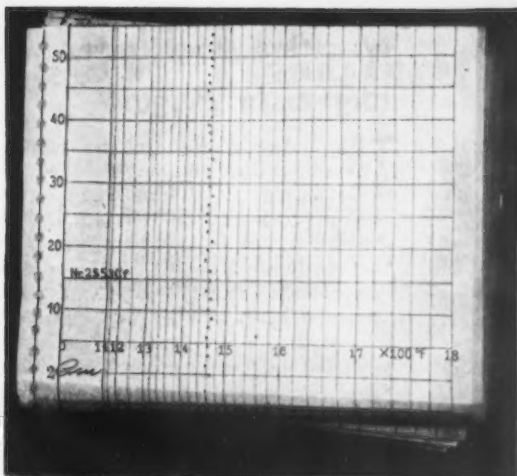
Cutting Tools, Inc., Detroit, has been organized by John E. Moore, 303 General Motors Research Building, and associates, to manufacture drills and other mechanical cutting tools.

HEAT

CONSTANT THREAT MADE DOCILE SERVANT BY INLAND EQUIPMENT



This recording instrument provides an instantaneous check on finishing temperatures for the crew of the Inland Strip Mill. It also writes a chart (shown below) wherein the history of every single slab is recorded, which becomes part of Inland's permanent records.



Heat is both an essential tool and a constant threat in the making of steel. Above is pictured an instrument typifying the equipment in the various departments of the Inland Steel Plant to make heat guarantee quality rather than compromise it.

This temperature recording instrument is located at the last roll stand of the Inland Continuous Strip Mill. The temperature of the steel strip as it passes this last stand is vital to quality and finish. By means of this instantaneous proof of correct temperature, the mill crew are able to hold rolling temperatures remarkably steady.

Prompt incorporation of such scientific advances as this is one reason why Inland Rolled Steel Products have always been outstanding for quality. INLAND STEEL COMPANY, 38 So. Dearborn St., Chicago, Ill.

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Sheets Strip Tin Plate
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Rails Track Accessories
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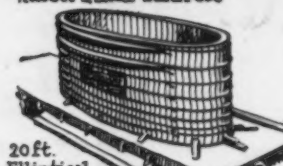
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TANKS!
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Rubber Lined Storage Tanks




Rubber Lined Tank Car



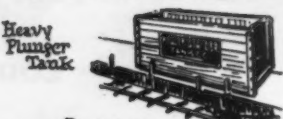
20 ft. Elliptical Tank




Concrete Bottom Tank



Rectangular Tank with Water Tight Compartments




Heavy Plunger Tank



Tank Equipped with Self-Contained Agitator



Pressure Tank



40000 Gallon Sprinkler Tank

Write for Catalog!
THE HAUSER-STANDER TANK CO.
CINCINNATI, OHIO

◀ PACIFIC COAST ▶

Monarch Winery, Victor Road, Lodi, Cal., Leo Starr, manager, plans new one-story plant, 100 x 150 ft. Cost about \$65,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 2 for 900 gross self-tapping steel screws (Schedule 2342) for Mare Island Navy Yard.

Calavo Growers' Exchange, Vista, Cal., care of Herbert A. Hamm, 1041 East Green Street, Pasadena, Cal., architect, has plans for first unit of new packing plant, one-story, costing over \$25,000 with conveying, loading, packing and other mechanical equipment. Other units will be built later.

South Coast Boat-Building Co., Newport Beach, Cal., has approved plans for one-story addition, 60 x 120 ft., for storage and repair service.

Santa Cruz Portland Cement Co., Crocker Building, San Francisco, has secured low bid from L. E. Dixon Co., 609 South Grand Avenue, Los Angeles, for branch storage and distributing plant at Long Beach, Cal., with treatment mill and packing house. Cost about \$100,000 with equipment. R. A. Kinzie is chief engineer.

Board of Education, Coalinga Union High School District, Coalinga, Cal., plans manual training department in new senior high school, for which bids will soon be asked on general contract. Fund of \$150,000 has been arranged through Federal aid. W. D. Coates, Rowell Building, Fresno, Cal., is architect.

Show Low Silver Creek Water Conservation District, Show Low, Navajo County, Ariz., plans extensions and improvements in power plant and water system, including increased water supply from Silver Creek. Fund of \$148,000 has been secured through Federal aid for project. Additional equipment will be installed.

Escondido Orange Association, Escondido, Cal., W. L. Carson, general manager, will soon take bids for new one-story and basement packing plant, 120 x 300 ft. Cost close to \$100,000 with conveying, loading, precooling, packing and other mechanical equipment. W. W. Ache, 1616 Fourth Avenue, Los Angeles, is architect.

◀ FOREIGN ▶

Ministry of Public Works, Montevideo, Uruguay, asks bids until Jan. 15, 1935, for new hydroelectric generating plant on Rio Negro River, including power site development, power dam, equipment, etc. Plans and specifications at office of Consulate General of Uruguay, 17 Battery Place, New York.

Newey Brothers, Ltd., Tipton and Birmingham, England, affiliated with D. F. Taylor & Co., Ltd., Birmingham, manufacturer of metal wares and products, has purchased a factory at Tipton, totaling about 45,000 sq. ft. floor space for new works, maintaining present plants as heretofore. Cost close to \$100,000.

Commissariat of Heavy Industry, Soviet Russian Government, Moscow, plans additions to metal refinery at Darasun, Transbaikalian district. Cost over \$400,000 with equipment. Amtorg Trading Corp., 261 Fifth Avenue, New York, is official buying agency.

Erratum

It was erroneously reported in THE IRON AGE of Sept. 13, page 40, that the St. Louis Car Co., St. Louis, had obtained approval of a petition for a reorganization under the new Federal bankruptcy act. Such a petition has been filed not by the St. Louis Car Co. but by the St. Louis Can Co., 904 South Fourteenth Street, St. Louis. The petition of the can company has not yet been granted by the court.

Million Dollar Arc Welded Steam Line

(Concluded from page 27)

and C Street, S.W. It serves the following buildings: Commerce, Post Office, Justice, Treasury, Labor and I.C.C., Smithsonian and other museums, Agriculture, Printing, Court House, Patent Office and others.

The new line illustrated in the photographs is designed for 300 lb. working pressure. High pressure steam mains range from 18 in. down to 4 in. while condensate, return and drip mains range from 10 in. to 1 1/4 in. Specifications called for 246 slip type and packless expansion joints, numerous expansion loops, steam flow meters and much intricate piping work.

All the pipe joints and sleeves, necessary structural steel work, guides, anchorages, etc., were arc welded. Welding was done by the shielded arc process using Fleetweld electrodes and machines manufactured by the Lincoln Electric Co., Cleveland.

The Northeastern Co. is the construction subsidiary of the American District Steam Co., originators of district heating systems which supply steam for heating and power purposes from a central boiler plant.

Machine Tool Index Higher In August

THE index of machine tool orders, based on the volume of shipments in 1926, rose to 41.4 in August from 34.7 in July and 35.3 in June. The August figure is based on reports to the National Machine Tool Builders' Association from 169 companies, compared with 172 in the preceding month and with 166 in June. Twenty-one per cent of the August orders were from foreign sources, compared with 24 per cent in July and with 22 per cent in June.

August distribution of orders throughout the industry was much improved, 53 per cent of the companies reporting having had better business in August than in July.

Schaible Foundry & Brass Works Co., Cincinnati, manufacturer of plumbing supplies, is moving into larger quarters at 1064 Sumner Street.

Carboloy Co., Inc., formerly located at 2481 East Grand Boulevard, Detroit, has moved general offices, Detroit district office, and main manufacturing plant to new, larger quarters at 2985 East Jefferson Avenue, Detroit, where two entire floors of a modern manufacturing and commercial building will be occupied.



EVERY PHASE ...of Handling Corrosive Solutions

● We believe that we are safe in saying that every important industry having a corrosion problem has used Ace rubber lining to advantage—with a definite saving in dollars and cents—with safety to property, labor and equipment—and with low maintenance and repair expense.

Ace hard rubber lining for tanks, pumps, pipe lines with complete fittings, valves, etc., prevents corrosion and contamination. The nature of hard rubber is such that it may be

The lining of equipment is as simple as it is effective. The Ace patented method employs a soft rubber interlining between the hard rubber and the metal. This inner layer is not exposed to the chemical solution handled but serves as a permanent bond and, also, as a shock absorber.

compounded to meet the specific requirement of your process. There are hundreds of unusual and interesting installations where Ace hard rubber lining has proved its economy.

May we have an opportunity to show you how Ace hard rubber lined equipment can work

for you, *economically*? We will be glad to send our catalogue, information or quotations.

AMERICAN HARD RUBBER COMPANY

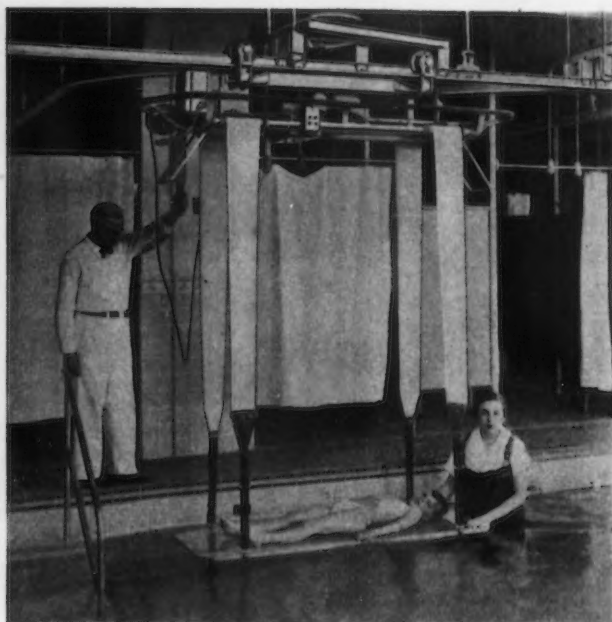
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Prevent Corrosion

Why this Unusual Photograph?

- Because we believe you are humanely minded—are interested in children and their welfare.



OVERHEAD Materials Handling Equipment is here used to transport paralyzed patients from one part of the building to another. The bed or "guerney" operated by a hoist is used to lower the patient into the pool where exercise is made easy by the buoyant effects of the water and the time of convalescence very much shortened. There are numbers of other similar and related installations of Materials Handling Equipment.

Many manufacturers have planned and purchased Materials Handling Equipment with the welfare of employees as the major consideration. Such purchases in many instances have produced monetary returns sufficient to pay the cost thereof.

Consult your 'phone directory under Cleveland Tramrail.

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Hand or Electric
Overhead Materials
Transportation Equipment

DIVISION OF
THE CLEVELAND CRANE & ENGINEERING CO.
WICKLIFFE, OHIO

British Iron and Steel Output Off In August

LONDON, Sept. 17 (*By Cable*).—August steel ingot production in Great Britain was 667,000 tons, compared with 718,200 tons in the preceding month and with 551,300 tons in August, 1933.

British pig iron output in August was 503,300 tons, compared with 527,200 tons in July and with 362,700 tons in August of last year.

Monthly production of steel ingots and pig iron in 1933 and in the first eight months of 1934 was as follows:

1933	Pig Iron	Steel Ingots
Jan.	286,600	444,400
Feb.	270,800	482,700
March	332,200	577,700
April	324,700	509,600
May	339,900	599,600
June	345,600	568,800
July	343,900	567,500
Aug.	362,700	551,300
Eight months, 1933	2,605,700	4,301,600
Sept.	359,700	669,000
Oct.	373,300	668,300
Nov.	374,900	695,000
Dec.	409,300	668,900
	4,123,600	7,002,800
1934		
Jan.	441,300	711,000
Feb.	414,400	707,500
March	503,600	829,700
April	496,300	716,800
May	529,900	780,000
June	515,700	757,500
July	527,200	718,200
Aug.	503,300	667,000
Eight months, 1934	3,931,700	5,887,700

Acetylene Group Plans Pittsburgh Meeting

PLANs for the annual meeting of the International Acetylene Association, which will be held at the William Penn Hotel, Pittsburgh, Nov. 14-16, are being completed. Speakers will include Dr. George T. Baker, president, Carnegie Institute of Technology; E. F. Blank, Jones & Laughlin Steel Corp.; Dean E. A. Holbrook, University of Pittsburgh; Prof. J. H. Zimmerman, Massachusetts Institute of Technology; A. R. Ellis, vice-president, Pittsburgh Testing Laboratories; E. W. Smith, vice-president, Pennsylvania Railroad, and Dean R. L. Sackett, Pennsylvania State College.

Technical sessions will include discussion of oxy-acetylene cutting as applied to steel mill work, the metallurgical aspects of the oxy-acetylene welding process, pipe welding and testing, application of welding to the transportation industries, and education and safety in welding. H. F. Reinhard, 30 East Forty-second Street, New York, is secretary of the association.